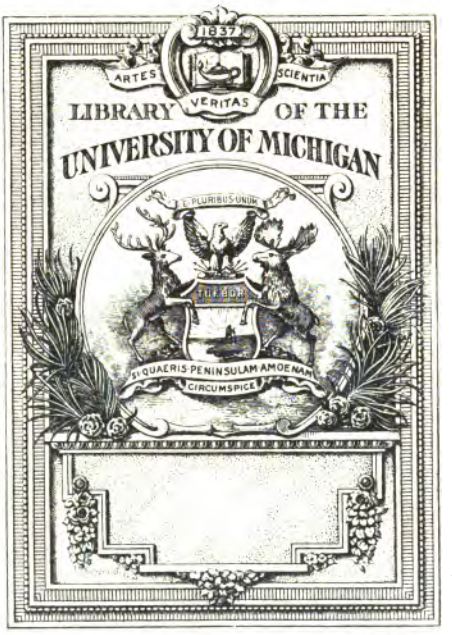
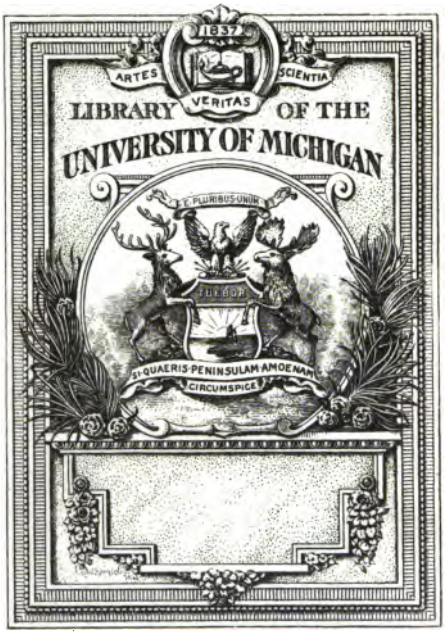

1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE


1837
ARTES
SCIENTIA
VERITAS
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TUEBOR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

EMPIRICAL AND RATIONAL

# PSYCHOLOGY

EMBRACING COGNITIONS, FEELINGS, AND VOLITIONS

BY

A. Aaron SCHUYLER, LL. D.

*President of Baldwin University, Author of Principles of Logic, and a Series of Mathematical Works*

*"How charming is divine Philosophy!*
*Not harsh and crabbed, as dull fools suppose,*
*But musical as is Apollo's lute,*
*And a perpetual Feast of nectared sweets,*
*Where no crude surfeit reigns."*

VAN ANTWERP, BRAGG & CO.

CINCINNATI NEW YORK

## Eclectic Educational Series.

DR. SCHUYLER'S WORKS.

*Schuyler's Principles of Logic.*
*Schuyler's Psychology.*
*Schuyler's Complete Algebra.*
*Schuyler's Elements of Geometry.*
*Schuyler's Trigonometry and Mensuration* (*Ray's Series*).
*Schuyler's Surveying and Navigation* (*Ray's Series*).

---

**Descriptive List and Prices on Application.**

---

# PREFACE.

PSYCHOLOGY treats directly of Cognition, Feeling, and Volition, and indirectly of Intellect, Sensibility, and Will. Greater prominence is thus given to the phenomena of the soul, with their conditions and laws, than to the faculties implied by these phenomena.

Though much light has, no doubt, been thrown upon Psychology by the investigations of Physiologists,—light which the Psychologist should heartily welcome,—yet to know any phenomenon, as it is in itself, we must study it as revealed in consciousness. This is especially true of the higher processes of thought. Thus, to understand the nature of the reasoning process, it will not suffice to examine the structure and functions of the nerves, the ganglia, the brain, and the organs of sense, but we must analyze the reasoning process itself as a known fact of conscious experience.

The discussion of the Intuitions is introduced at an early stage, since they afford the fundamental principles for subsequent investigations. To defer the consideration of fundamental principles to the last pages, as is commonly done, would embarass all preceding discussions. What would be thought of a writer on Geometry, who should put his axioms on the last page of his book? The difficulty of discussing fundamental principles is no justification for such an arrangement, since any mind mature enough to undertake the study of Psychology, is certainly prepared to understand a clear presentation of its first principles.

The elements involved in the act of Perception have been discriminated with much care, and an attempt has been made to exhibit clearly and correctly the nature of this act. That a correct explanation of perception has been given, will, it is believed, be admitted by those who will carefully study this process in itself, as revealed by their own consciousness, and as developed in the chapters pertaining to this subject.

The interesting phenomena of Representation, embracing Memory, Imagination, and Phantasy have been concisely and clearly exhibited. Light has been thrown on the Law of Association, especially in regard to the transition from one series of representations to another.

The processes of Elaboration have been fully and carefully treated. These phenomena can be understood only by actually exhibiting them, and developing their laws. No vague discourse about the logical processes will suffice to make known their principles and laws, or to unfold their philosophy.

The Aristotelian Logic will, perhaps, never be superseded; but, as is needful, it will be supplemented by Modern Logic, which supplies the defects of the ancient, while the ancient affords the necessary basis for the modern. Each may, therefore, be regarded as the complement or indispensable counterpart of the other.

The brief space of a few pages only has been given to the subjects of Mood, Figure, and Reduction. These subjects, though not essential to Logic itself, are interesting in themselves, and in their historical associations.

There is a growing demand, by progresssive teachers, to have Logic presented in connection with Psychology. To meet this demand, the third division of Part I. is made a course of Logic. It is even more and better than this, since it presents, not only the logical processes themselves, but their philosophy, and the relation

of elaborated thought to the elementary phenomena of the mind.

To those students who have not studied Logic, this division will prove an ample course; and to those who have, it will be a thorough review, giving broader views of thought, and deeper insight into the abstruse processes of the intellectual powers.

The phenomena of Feeling and Volition, with their corresponding faculties of Sensibility and Will, have, in the second and third parts, been as fully discussed as the limits of the book would permit. It is believed that these parts, though necessarily concise, will be not only interesting, but clear and thorough.

The value of philosophic studies can scarcely be overestimated, and it has been maintained by philosophers of opposing schools. John Stuart Mill, in his Examination of Hamilton's Philosophy, Vol. I., page 10, says, "That a true Psychology is the indispensable scientific basis of morals, of politics, of the science and art of education; that the difficulties of Metaphysics lie at the root of all science; that these difficulties can only be quieted by being resolved; and that until they are resolved, positively if possible, but at any rate negatively, we are never assured that any human knowledge, even physical, stands on solid foundations."

Sir Wm. Hamilton, *Metaphysics, Lecture II.*, says: "In the compass of our experience, we distinguish two series of facts,—the facts of the external or material world, and the facts of the internal world, or world of intelligence. . . . The phenomena of the material world are subjected to immutable laws, and are produced and reproduced in the same invariable succession, and manifest only the blind force of a mechanical necessity.

"The phenomena of man are, in part, subjected to the laws of the external universe. As dependent upon a

bodily organization, as actuated by sensual propensities and animal wants, he belongs to matter; and in this respect, he is the slave of necessity. But what man holds of matter does not make up his personality. They are his, not he; man is not an organism,—he is an intelligence served by organs. For, in man, there are tendencies,—there is a law,—which continually urge him to prove that he is more powerful than the nature by which he is surrounded and penetrated. He is conscious to himself of faculties not comprised in the chain of physical necessity; his intelligence reveals prescriptive principles of action, absolute and universal, in the law of duty, and a liberty capable of carrying that law into effect, in opposition to the solicitations, the impulses of his material nature. . . . .

"Now, the study of Philosophy operates in three ways to establish that assurance of human liberty which is necessary for a rational belief in our moral nature in a moral world, and in a moral Ruler of that world.

"In the first place, an attentive consideration of the phenomena of mind is requisite in order to a luminous and distinct apprehension of liberty as a fact or datum of the intelligence. For though, without philosophy, a natural conviction of free agency lives and works in the recesses of every human mind, it requires a process of philosophical thought to bring this conviction to clear consciousness and scientific certainty. . . . .

"In the second place, a profound philosophy is necessary to obviate the difficulties which meet us whenever we attempt to explain the possibility of this fact, and to prove that the datum of liberty is not a mere illusion. . . . .

"In the third place, the study of mind is necessary to counterbalance and correct the influence of the study of matter; and this utility of Metaphysics rises in propor-

tion to the progress of the natural sciences, and to the greater attention which they engross."

Psychology, including Logic, constitutes the essential basis of a philosophic course. However valuable a work on Metaphysics, as that of Ferrier's or Bowne's may be, it requires, as the indispensable condition of its profitable perusal, a preliminary knowledge of the phenomena and laws of mind.

A few words in reference to the time and method of study may not be amiss. In case the school year is divided into three terms, as is now usually the case, Psychology ought to be studied by the senior class of the Public Schools, or by the junior or senior class of the Colleges, the first and second terms, and the History of Philosophy the third term; but if the teacher prefers, Psychology can be taken the first term by itself, and, in connection with the History of Philosophy, the second and third terms.

For valuable critical suggestions, thanks are due to *B. A. Hinsdale*, late President of Hiram College, now Superintendent of Public Instruction, Cleveland, Ohio, who kindly consented to read the manuscript.

This work is presented to the public with the hope that it will be profitable, not only to the student, but to the general reader who may desire to understand the facts and laws of mind; that it will prove especially interesting to those who may wish to revive their knowledge of Philosophy; and that thus the time and labor and thought bestowed in its preparation may not be wanting in good results.

# CONTENTS.

DIVISION II.—REPRESENTATION.



DIVISION III.—ELABORATION.

## PART II.—FEELING AND THE SENSIBILITY.



## PART III.—VOLITION AND THE WILL.

# PSYCHOLOGY.

## INTRODUCTION.

---

**Psychology** is the science which treats of the phenomena and the faculties of the human soul. It treats directly of phenomena and indirectly of faculties, since faculties are known only through phenomena.

**The aim** of psychology is to ascertain the phenomena of the human soul, to analyze and classify these phenomena, and to determine their conditions and laws.

**The utility** of psychology is evident from the fact that it supplies the fundamental principles for all the sciences pertaining to man as an intellectual, moral, social, and religious being; that it cultivates the mind by calling its faculties into vigorous exercise, thus contributing to our perfection and consequently to our happiness; and that it checks the evils resulting from too exclusive pursuit of physical science, by directing our attention to our spiritual nature, moral dignity, and probable destiny.

**The means** for psychological study may be divided into two classes — principal and collateral.

**The principal means** for psychological study are consciousness, reflection, and rational intuition.

**Consciousness** is the immediate knowledge which the soul has of its phenomena. It is the primary means of

collecting the facts pertaining to the operations of the various faculties of the soul.

**Reflection** is the turning back of the thoughts to the consideration of psychical phenomena. It is the means by which the phenomena of the soul are analyzed, compared, identified or discriminated, and classified. Thus, by reflection, psychical phenomena are found to be reducible to three classes — cognitions, or acts of knowledge; feelings, or sensations, instincts, appetites, emotions, affections, and desires; and volitions, or choices.

**Rational intuition** is the immediate apprehension of necessary truth. It is the means by which the soul apprehends the necessity of the conditions and laws of its phenomena. Thus, by rational intuition, the phenomena of the soul are referred to causes capable of producing them; for, these phenomena, beginning in time, are not eternal. They can not bring themselves into existence, since they can not act before they exist.

**A faculty** of the soul is its capability of doing a certain act, or its susceptibility of being in a certain state.

Hence, the faculties of the soul, its powers and susceptibilities, are, as inferred from its phenomena, likewise reducible to three classes — the *Intellect*, or faculty of cognition; the *Sensibility*, or susceptibility of feeling; and the *Will*, or power of volition.

It is, therefore, evident that the intimate relation of the psychical phenomena, the cognitions, feelings, and volitions, implies the intimate relation of the faculties, the intellect, the sensibility, and the will, and the unity of the soul, their common origin; that these phenomena, though fleeting, imply, from their continued succession and spiritual character, a permanent spiritual subject, variously called the *soul*, *spirit*, *mind*, *I*, *self*, or *ego*, endowed with the faculties of intellect, sensibility, and will.

**The collateral means** for psychological study are the

sciences of Biology, Anthropology, Sociology, Anatomy, and Physiology.

**Biology** is the science of life. It treats of the phenomena manifested by the living beings of the two organic kingdoms, vegetable and animal. As a science, Biology is fundamental and comprehensive. It throws great light on all the other sciences pertaining to living beings.

**Anthropology** is the science which treats of man according to the methods of Natural History. It considers him as a complex being, consisting of body, animal life, and soul or spirit. It views man in a general way, as to race, sex, age, heredity, and the reciprocal influence of body and soul. It studies him as affected by climate, education, religion, government, employment, and accidental circumstances, leaving the more profound and scientific study of the physical and spiritual natures of man to distinct and special sciences.

**Sociology** is the science of society. It treats of man in social organizations — the family, society, the church, or the state. Man's capabilities are known by his manifestations and achievements. In war, he has exhibited ambition and patriotism, courage and cruelty, genius and rapacity. In peace, he has cultivated science, literature, and art; he has engaged in agriculture, in the mechanic arts, and in commerce; he has founded governments, organized religions, and developed the learned professions.

**Anatomy and Physiology** are related sciences which treat of the structure and functions of man's physical organism. A knowledge of these sciences is a valuable preparation for the study of mind; since the body, especially the nervous system, sustains vital relations to the phenomena of the soul. In the perception of external objects, the mind uses the organs of the five senses. In executing its volitions, it employs the body as its in-

strument; but in the higher operations of thought, it seems to act independently of all material organs, exhibiting phenomena totally unlike the properties of matter.

In endeavoring to ascertain the relations existing between the body and soul, the approved methods of science — observation, experiment, induction, and deduction — are to be employed; and though nothing is to be assumed without evidence, yet it may be allowed, in the course of an investigation, to form an hypothesis, with the understanding that it is merely provisional, and that it must stand or fall according as it is confirmed or refuted by subsequent investigations.

It is legitimate to endeavor to ascertain what physical conditions, if any, are the invariable antecedents or consequents, as the case may be, of certain psychical states; but it is not legitimate to assume, without proof, except provisionally, that every psychical phenomenon must have fixed physical antecedents or consequents.

Though our knowledge of the body has already enlarged our knowledge of the conditions of the phenomena of the soul, and may be expected to do so more and more as our investigations are continued, yet it is to be remembered that we can understand neither perception, nor representation, nor elaboration, by examining the nerves with the Physiologist, nor by feeling the head after the manner of the Phrenologist, but only by studying these processes themselves, in the light of consciousness, by the aid of reflection and rational intuition.

The **Rules for Investigation** are the following:

1. Employ the principal and collateral means of study.

2. Take, as fundamental facts, the psychical phenomena given in consciousness, all the phenomena, and nothing but the phenomena.

3. Carefully observe, analyze, compare, and classify the phenomena.

4. Determine the conditions and laws of the phenomena.

5. Refer phenomena essentially alike to the same faculty, and those essentially unlike to different faculties.

6. Make an accurate register of the results.

In order to present a bird's-eye view of the subject, we subjoin a summary classification of the phenomena of the human soul, also a classification of the faculties implied by these phenomena. These classifications give an outline of the subject, and they will be useful for reference, as we pursue our investigations.

It will be observed that certain phenomena and the corresponding faculties have the same names, a defect unavoidable on account of the imperfection of language. The word *Reason* is used to denote the reasoning power. It is sometimes used to denote the logical power in general, also the power of rational intuition.

CLASSIFICATION OF PSYCHICAL PHENOMENA.

- **Cognition**
  - Acquisition
    - Subjective
      - Consciousness.
      - Reflection.
    - Rational—Intuition.
    - Objective—Perception.
  - Representation
    - Memory.
    - Imagination.
    - Phantasy.
  - Elaboration
    - Conceiving.
    - Judging.
    - Reasoning.
- **Feeling**
  - Physical feeling
    - Sensation.
    - Instinct.
    - Appetite.
  - Vital feeling
    - Of rest or fatigue.
    - Of vigor or languor.
    - Of health or sickness.
  - Psychical feeling
    - Emotions.
    - Affections.
    - Desires.
- **Volition.**
  - Solicitation—the antecedent of volition.
  - Volition—the choice or decision.
  - Execution—the consequent of volition.

CLASSIFICATION OF THE PSYCHICAL FACULTIES.

- **Intellect**
  - Acquisitive faculties
    - Subjective
      - Consciousness.
      - Reflection.
    - Rational—Intuition.
    - Objective—Perception.
  - Representative faculties
    - Memory.
    - Imagination.
    - Phantasy.
  - Logical faculties
    - Conception.
    - Judgment.
    - Reason.
- **Sensibility**
  - Physical sensibility
    - Sensation.
    - Instinct.
    - Appetite.
  - Vital sensibility
    - Of rest or fatigue.
    - Of vigor or languor.
    - Of health or sickness.
  - Psychical sensibility
    - Susceptibility of emotion.
    - Susceptibility of affection.
    - Susceptibility of desire.
- **Will . .**
  - Passive susceptibility—as solicited by motive.
  - Elective power—ability to choose or decide.
  - Executive energy—as exerted in execution.

REVIEW.—Reproduce on blackboard, expand 6 and 7, and elucidate.

- **Introduction**
  1. Definition.
  2. Aim
     - 1st.
     - 2d.
     - 3d.
  3. Utility
     - 1st.
     - 2d.
     - 3d.
  4. Means of study
     - 1st. Principal
       - (1)
       - (2)
       - (3)
     - 2d. Collateral
       - (1)
       - (2)
       - (3)
       - (4)
  5. Rules for investigation
     - 1st.
     - 2d.
     - 3d.
     - 4th.
     - 5th.
     - 6th.
  6. Classification of psychical phenomena.
  7. Classification of psychical faculties.

# PART I.

## *COGNITION AND THE INTELLECT.*

# DIVISION I.

## ACQUISITION AND THE ACQUISITIVE FACULTIES.

## CHAPTER I.

### CONSCIOUSNESS.

**1. Consciousness as an act defined and characterized.** — Consciousness is the immediate knowledge which the soul has of its phenomena. It is *empirical*, since it apprehends its object as contingent, and not as necessary. It is *intuitive*, since it reaches its object directly, and not through any medium, as the senses, the memory, or the reasoning processes. It is, therefore, *empirical intuition.*

**2. Consciousness implied by all psychical phenomena.** — Cognition implies consciousness; for if I know, I know that I know, since if I do not know that I know, I do not know. In like manner, it can be proved that feeling implies consciousness, and that volition implies consciousness. Hence the absurdity of the opinion that consciousness is impossible, as held by *M. Comte*, who says in reference to the consciousness of intellectual activity, "In order to observe, your intellect must pause from its activity; yet it is this very activity you want to observe. If you can not effect the pause, you can not observe; if you do effect it, there is nothing to observe." *Comte's Positive Philosophy, by H. Martineau, page* 33. But instead of its being impossible to be conscious of knowing, it is impossible to know without being con-

scious of knowing. Consciousness is involved in knowing, as an essential element.

**3. Consciousness an intellectual act.** — Though consciousness is implied by all psychical phenomena, whether cognitions, feelings, or volitions, yet it is itself an act of the intellect. The etymology of the word *consciousness*, from *con* and *scio*, indicates its meaning — that along with knowing an object, I know also the knowing. In case the object of consciousness is a phenomenon of the sensibility, the consciousness of the feeling is scarcely distinguishable from the feeling. Thus, if to be conscious of pain is not identical with the feeling of pain, it is to be aware of the feeling. The faculties of the soul are so intimately related, that they do not act independently of one another. Knowledge affords the condition of desire and affection; and both knowledge and feeling precede and accompany volition.

**4. Consciousness as a faculty defined and considered.** —Consciousness is the capability of knowing our psychical acts or states. If the soul is conscious of its cognitions, feelings, and volitions, it has the faculty of being conscious of these phenomena, and this faculty is called *consciousness*. The term *consciousness*, then, is used to denote both an act and the faculty to which the act is referred. As an act, it is the immediate cognizance which the soul takes of its phenomena, and is implied, as a necessary condition, by the phenomena of cognition, feeling, or volition. As a faculty, it is the capability of immediately knowing psychical phenomena, and is implied by the act of consciousness, as a necessary condition.

**5. Objects of consciousness psychical phenomena.** — The *objects* of consciousness are psychical phenomena, actual and present. The soul is conscious of all its phenomena — all appearances; for, if there is an appearance, that appearance is known or realized, otherwise it is not

an appearance; but a realization of the appearance is consciousness.

The object of consciousness is nothing else than a psychical phenomenon. In the first place, we are not conscious of an external object, as a house. If we perceive a house, we are conscious of the perception, but not of the house. Consciousness is *immediate* knowledge; but the knowledge of an external object is *mediate*, since it is derived from the sensation which the object causes. In the second place, we are not conscious of the soul, nor of the soul as knowing, feeling, or willing, but of the knowing, feeling, and willing, as phenomena. The necessity of the soul, as the subject of these phenomena, is apprehended by rational intuition, as will be more fully shown hereafter.

**6. Processes which are not objects of consciousness.**— In saying that the soul is conscious of all its phenomena, we do not affirm that it is conscious of all its processes. Phenomena are processes that appear. The soul is conscious of these processes, otherwise they could not be phenomena, that is, could not appear.

There are, however, other processes that are not phenomena; and since these do not appear, their existence is not an object of consciousness, but a matter of inference. This is ultimately true of consciousness itself, which, though an act, is not a distinct phenomenon, but an element of a phenomenon. For, if the act of consciousness is a distinct phenomenon, it appears, and is, therefore, an object of consciousness. That is, in being conscious of a phenomenon, we should, on this supposition, be conscious of the consciousness, and in like manner, we should be conscious of this second consciousness, and so on, which involves an infinite series of acts of consciousness, an impossibility in finite time. Granting that, by special effort, an indefinite number of acts of con-

sciousness might thus take place, yet, in general, the phenomenon is the object of attention, but not the consciousness of it, much less the consciousness of the consciousness of it, and so on.

There are other psychical processes, inferred from their effects, which are unknown to consciousness. These processes have, by certain philosophers, been inconsistently called *latent modifications of consciousness*, and by others, *unconscious cerebrations*. They are *latent processes*, whether purely psychological, physiological, or mixed.

**7. Idea and ideation.**—The phenomenon which is an object of consciousness develops and crystallizes into an *idea* of the phenomenon. The development of the idea is called *ideation*. The idea may afterwards be recalled in the memory, but not the original phenomenon. The idea when recalled is an object of consciousness.

**8. Consciousness simultaneous with its object.**—In the first place, the consciousness of a phenomenon can not be antecedent to that phenomenon, since we should, in that case, be conscious of that which has no existence, which is impossible. In the next place, the consciousness of a phenomenon can not be subsequent to that phenomenon, since, before the consciousness, the supposed phenomenon could not appear, and hence would not be a phenomenon; that is, consciousness is essential to the phenomenon, and is, therefore, not subsequent to it. The formula of consciousness, I know that I know, does not imply that I first know, then, after that, know that I know; for, if I first know, without being conscious that I know, then, at the first instant of knowing, before the consciousness of the knowledge, I know, without knowing that I know, which is absurd.

The view that the consciousness of a psychical phenomenon is subsequent to that phenomenon, makes consciousness depend on memory. But if we are not con-

scious of a phenomenon at the instant of its occurrence, we should know nothing of it at that instant, and, therefore, have nothing to remember; hence, memory itself would be impossible, and consciousness, thus depending on memory, would also be impossible; but as both memory and consciousness are facts, the theory that consciousness is subsequent to its object, which annihilates both memory and consciousness, can not be true.

We have now found that consciousness of a phenomenon is neither antecedent to that phenomenon nor subsequent to it; hence, the consciousness of a phenomenon is simultaneous with that phenomenon.

**9. Consciousness a logical consequent of its object.**— Though consciousness of a phenomenon is simultaneous with the phenomenon, yet the phenomenon involves the consciousness as its logical consequent, otherwise it could not be a phenomenon, that is, could not appear; and the consciousness implies the phenomenon as its logical antecedent, otherwise there would be nothing of which to be conscious.

That a logical consequent may be chronologically simultaneous with its logical antecedent, may be illustrated by the equation.

$$y = f(x).$$

This equation is read, $y$ is equal to a function of $x$, and signifies that the value of $y$ depends on that of $x$, so that, if $x$ changes, changing the value of $f(x)$, $y$ changes, so as always to be equal to $f(x)$.

Now, let $x$ change, the change in $x$ changing the value of $f(x)$. The change in $f(x)$ is simultaneous with the change in $x$, otherwise $f(x)$ has the same value while $x$ has different values, which is impossible.

As $x$ changes, the change in $x$ is followed by a change in $y$; but the word *followed* is used in a *logical*, not in a *chronological* sense; for the change in $y$ is simultaneous

with the change in $x$, since if $y$ could remain, without change, a moment after the change in $x$, then, for that moment, $y$ would not be equal to $f(x)$, which is contrary to the supposition that $y$ is always equal to $f(x)$. Hence, the change in $y$, though logically consequent to the change in $x$, is chronologically simultaneous with that change.

This will serve to illustrate the possibility of the fact that logically consciousness may be the consequent of a phenomenon, while chronologically the phenomenon and the consciousness of it may be simultaneous.

**10. Kinds of consciousness — natural, ethical, and abnormal.**— 1st. *Natural consciousness* is that ordinary form of consciousness which is common to all healthy minds. It is simply immediate knowledge of psychical phenomena, whether cognitions, feelings, or volitions.

2d. *Ethical consciousness* is that form of consciousness which is induced by those who practice self-inspection in view of ascertaining their moral condition. It indicates the controlling influence of conscience, and a sensitiveness with regard to right and wrong. The development of this form of consciousness is mainly due to the influence of moral and religious systems. Ethical consciousness is, strictly speaking, reflection applied to moral states.

3d. *Abnormal consciousness* is that form of consciousness which is exhibited by bashful persons, who imagine that others are noticing their awkwardness. They are said to be *self-conscious.*

**11. Varying intensity of consciousness.**—Consciousness may vary in intensity from obscurity and indistinctness, through all the intermediate degrees, to clearness and distinctness. The degree of intensity depends largely upon the condition of the body, the character of the mind, age, culture, and the concentration of attention.

**12. General conditions of consciousness.** — These are a living subject, a faculty of consciousness, and psychical phenomena.

1st. *A living subject* is a condition of consciousness; for consciousness implies a being who is conscious.

2d. *A faculty* of consciousness is a condition of the *act* of consciousness; for without the faculty, or capability of being conscious, the act would be impossible.

3d. *A psychical* phenomenon is a condition of consciousness; for psychical phenomena are the only objects of consciousness; hence, in the absence of these phenomena, there can be no consciousness, since there would be nothing of which to be conscious.

**13. Conditions of vivid consciousness.** — These are the general conditions, above named, also varying psychical phenomena, abstraction, attention, and cultivation.

1st. The *general conditions* of consciousness are conditions of vivid consciousness; for whatever is essential to consciousness itself, is essential to any degree of consciousness, and hence, to vivid consciousness.

2d. *Varying psychical phenomena* are conditions of vivid consciousness; for a continuance in a state the same in kind throughout, would be attended by a decreasing degree of intensity of consciousness, tending to total unconsciousness. Thus, the miller is scarcely conscious of hearing the noise of the mill, though if it made an unusual noise, he would at once be clearly conscious of the change in his sensations.

3d. *Abstraction and attention* are conditions of vivid consciousness; for the vividness of the consciousness of a particular phenomenon is increased by abstracting the attention from other phenomena, and concentrating it upon the given phenomenon.

4th. The *cultivation* of the faculty is a condition of vivid consciousness; for the power to induce a vivid de-

gree of consciousness, can be increased by its cultivation through habitual exercise.

**14. Validity of consciousness.** — The *validity* of consciousness must be admitted — its testimony must be received; for if we doubt it, we have no means of knowing that we doubt, but by consciousness itself. If we admit the validity of the testimony of consciousness concerning the reality of the doubt, we can not refuse its testimony to the reality of other psychical phenomena. Again, to doubt, leads to an impossibility; for then we must doubt that we doubt, and doubt that we doubt that we doubt, and so on, which involves an infinite series of doubts, an impossibility in finite time.

An *extension* of the testimony of consciousness can be made by a comparison of our own psychical phenomena, as certified to by our own consciousness, with those of other persons, as obtained by testimony. This tends to confirm our own experience, to enlarge our knowledge, and to correct unhealthy developments.

**15. Difficulties in consciousness.** — The introspective method of consciousness, in case of a single well-defined phenomenon of at least average intensity, is to be regarded as reliable and authoritative. In regard to positive pain or pleasure, a clear thought, a lively emotion, an intense desire, an ardent affection, or a decided choice, there can be no doubt.

The phenomena of consciousness are, however, for the most part, exceedingly complex. Thoughts, feelings, and volitions, following in quick succession, blending and vanishing, to be succeeded by others, present an incessantly shifting scene. Many of the elements of a state of consciousness are so brief and obscure, and appear so inextricably interwoven with others, that it appears difficult to distinguish them.

Consciousness is liable to certain illusions, which, by

being pointed out, may be avoided. These illusions, however, should be carefully discriminated from the illusions of perception, the mistakes of memory, and the fallacies of inference.

The illusions of perception, whether originating from sense-impressions, or from preconception, consist in objectifying erroneous ideas respecting material objects, and mistaking them for the qualities of those objects.

Mistakes of memory consist in believing that the creations of the imagination are faithful representations of past realities.

Fallacies of inference are illogical processes of the higher powers of thought.

Inferences from mental states are often mistaken for elements of those states. Thus, a person thrilled with a new joy exclaims, "This is the happiest moment of my life," believing that the truth of the inference is an object of consciousness. He is conscious of his joy, but not that it exceeds every past or future joy. A lover in vowing eternal fidelity, fancies that he is conscious of undying love, little dreaming that in time his ardent love may be transformed into violent hate.

Since consciousness is the mind's immediate knowledge of its own phenomena, an illusion of consciousness is a misapprehension of present psychical phenomena. It is not strange that illusions should arise. Time is requisite in order to bring a phenomenon under its representative idea, thus identifying it as belonging to a class. While doing this, the phenomenon vanishes, or changes, or blends with other phenomena.

Certain states have a general resemblance to one another, rendering either liable to be mistaken for the other. Thus, in morals, transient desires are often mistaken for settled purposes.

Preconception, or anticipation, gives rise to illusion.

Thus, when one anticipates pleasure from social intercourse, he imagines, when in company, that he is happy, especially if he sees signs of enjoyment in the faces of his companions.

Opinions agreeable to us, we readily accept, easily persuading ourselves that we believe them, when, perhaps, a more complete analysis of our state of mind would reveal doubt.

These considerations indicate the importance of subjecting the states of consciousness to the processes of reflection. These processes will be considered in the next chapter.

N. B.—Let the student write a synopsis of each chapter, and elucidate. See model synopsis at the close of the Introduction.

## CHAPTER II.

### REFLECTION.

**1. Reflection defined as an act and as a faculty.**—1st. *As an act.* Reflection is the turning back of our thoughts to the consideration of psychical phenomena. In perception, our thoughts are directed outward to the facts of matter; but in reflection, they are directed inward to the facts of mind. The act of reflection is complex, involving several processes.

2d. *As a faculty.* Reflection is the power to perform the act of reflection. The faculty is implied by the act. As the act of reflection is complex, so also is the faculty.

**2. Processes involved in reflection.**—These are abstraction, attention, analysis, synthesis, comparison, identification, discrimination, and classification.

1st. *Abstraction* is the withdrawal of the thoughts from certain phenomena in order to concentrate them upon other phenomena. The phenomena to which the thoughts are directed are properly said to be prescinded from the others, and the thoughts to be abstracted from the phenomena which are not considered. In ordinary usage, however, the phenomena considered are said to be abstracted from the others, and are called *abstractions.*

The *utility* of abstraction is evident; for by it we avoid the distraction and confusion which would result from considering many things at the same time. But it is not asserted that the mind can not, at the same time, attend properly to more than one thing.

An *illustration* of abstraction is found in the philoso-

pher, who, absorbed in thought, walks the crowded street, oblivious of what is going on around him. He is in a state of abstraction.

2d. *Attention* is the concentration of the thoughts upon a given phenomenon.

The *kinds* of attention are voluntary attention and involuntary. Voluntary attention, or attention proper, is the concentration of the thoughts upon a certain phenomenon, by an act of the will. Involuntary attention is simply spontaneous notice induced by the attractiveness of the object, without a special act of the will. It can be secured by making an object more attractive than other objects.

The *condition* of attention is abstraction; for, in order to concentrate the thoughts upon a certain phenomenon, it is necessary to abstract them from other phenomena.

The *consequences* of attention are clear and distinct cognitions, intensified activity, and, if long continued, weariness, followed by relaxation of attention. Cognitions become clear and distinct in proportion as the attention is abstracted from the many and disconnected, and concentrated upon the few and related. Augmented intensity of a certain activity follows from a suspension or a reduction of other activities, and a concentration of energy upon the given activity. Attention long continued results in weariness, followed by relaxation of attention and wandering thoughts. This indicates the need of rest, and the indication ought, in general, to be heeded. But even in this condition it is possible for a new object of absorbing interest to arrest the attention, arouse the mind from its lethargy, and call forth its awakened energies to a new activity.

The *degree of effort* required to concentrate the attention upon a given phenomenon, the condition of the subject remaining the same, varies directly as the attrac-

tiveness of the distracting phenomena, and inversely as the attractiveness of the given phenomenon.

The *utility of discipline* is evident; for, if the attention is too easily distracted, as is most commonly the case, the mind becomes the sport of passing occurrences, and is unable, without great difficulty, to accomplish its work; if the attention is too persistent, as is sometimes the case, it is transferred with difficulty from one thing to another, rendering the person absent-minded, when he ought to attend to the subject before him. A disciplined mind, in a normal condition, can fix or transfer its attention at pleasure. The power properly to control the attention is a matter of great importance, and should, as soon as possible, be acquired by every student.

3d. *Analysis* is the resolution of a phenomenon into its elements. A complex phenomenon, comprising more than one element, is susceptible of analysis; but a simple phenomenon, not comprising a plurality of elements, is not susceptible of analysis. The methods of analysis are simple inspection and experiment. Many complex phenomena can, by simple inspection, be at once resolved into their elements. Phenomena may appear simple to consciousness, when in reality they are complex. These may frequently be resolved by experiment, as in case of sound and color, thus calling to our aid the methods of physical science.

4th. *Synthesis* is the recombination of the elements of a phenomenon into the whole of which they are the constituent parts. By analysis, we discover the elements of a complex whole; by synthesis, we recombine the elements so as to reproduce that whole; analysis reveals minute parts; synthesis reproduces comprehensive wholes. Thus, by analysis, we have found the processes involved in reflection; by synthesis, we regard reflection as a whole involving these processes; by analysis, we

resolve the powers of the soul into their fundamental faculties—the intellect, the sensibility, and the will; by synthesis, we regard the soul as a whole whose powers are the intellect, the sensibility, and the will.

5th. *Comparison* is the simultaneous examination of two phenomena in view of detecting resemblances and differences. The phenomena compared may be both original, or one may be original and the other a representative idea, or both may be representative ideas. A past phenomenon can be compared with another, past or present, only by means of its representative idea.

The *conditions* of comparison are two phenomena, either original or representative, both present to a mind having the faculty of reflection; and, in thorough-going comparison, the processes of abstraction, attention, analysis, and synthesis.

The *purpose* sought to be accomplished by comparison is the detection of resemblances and differences. That it is possible to accomplish this purpose appears from the fact that in the act of comparison, the mind is conscious of two simultaneous phenomena with their peculiarities, and thus detects their resemblances and their differences.

6th. *Identification* is the recognition of a phenomenon on its recurrence, as one before known. Strictly speaking, a phenomenon does not recur; for the second appearance, though like the first, though identified with it as essentially the same, is not the first, since it can be distinguished from the first by the temporal circumstance, if by no other, that it occurred after the first. Simultaneous phenomena, though identified as essentially alike, may be distinguished by the spatial relation that they appear in different places.

An *illustration* of the nature of identification is obtained by looking at an object, and observing its appear-

ance, then closing the eyes, and, after a short interval, opening them, and looking at the object, again observing its appearance. The two appearances, though identified as essentially the same, are discriminated by their temporal relations — they occurred at different times, and one may be called the first, and the other the second. The material object, however, remains the same, though the appearances or phenomena which it induces can thus be discriminated. Again, look at an object, pressing one eye gently with the hand. Two images of that object will appear, which, though identified as essentially alike, are discriminated by their spatial relations — they appear in different places. Two phenomena, though identified as essentially alike, are said to be *numerically* different, since they can be discriminated by their temporal or spatial relations, one being the first, and the other the second in time or place.

The *condition* of identification is the comparison of phenomena essentially alike. There is, in identification, a consciousness of positive sameness, as in case of the two sounds produced by striking, in succession, the same key of a piano. Though, in this case, the identification is not absolute, but relative, since the two sounds are discriminated as numerically different, one being the first, and the other the second, yet growing out of the fact of essential sameness, and the lack of essential difference, there is positive detection of essential sameness, and the absence of the discrimination of essential difference.

7th. *Discrimination* is the detection of the differences between phenomena.

The *condition* of discrimination is the comparison of phenomena differing in their characteristics. The phenomena appearing to consciousness, differing in their characteristics, it is evident not only that discrimination

is possible, but it would seem impossible not to discriminate. Phenomena are identified, if they have essential agreements and no essential differences; but they are discriminated if they have essential differences, though they may have agreements.

8th. *Classification* is the assignment of phenomena essentially alike to the same class, and phenomena essentially unlike to different classes.

The *conditions* of classification are the comparison and identification or discrimination of phenomena.

The *characteristic* of a class is that attribute in reference to which the class is formed. All objects exhibiting the characteristic of a class are identified, or referred to that class, though they may exhibit differences. The identification is partial, not complete, since the agreement respects only the characteristics of the class. All objects wanting in the characteristic of a class are excluded from that class, though exhibiting other characteristics common to all the objects of the class.

The *order of procedure* in classification is either to ascend by generalization from individuals to species, and from species to genera, or to descend by division from genera to species, and from species to individuals.

*Generalization* is that process of classification by which resembling individuals are grouped into species and resembling species into genera. It embraces two varieties —*synthetic specification*, or the grouping of resembling individuals into a species, and *generification*, or the grouping of resembling species into a genus. A species includes all the individuals exhibiting the characteristic of the species, and excludes all other individuals. A genus includes all the species exhibiting the characteristic of the genus, and excludes all other species.

The *principle* of generalization is the combination of the common characteristics of all the individuals of the

species, or of all the species of the genus. The identification of these common characteristics of a species or of a genus, is essential to generalization.

*Division* is that process of classification by which a genus is resolved into its species, or a species into its subspecies or individuals, or in general, of a class into its members. It embraces two varieties — *analytic specification*, or the resolution of a genus into species subordinate to the genus but co-ordinate with one another, and *individualization*, or the resolution of a species into individuals subordinate to the species.

The *purpose* of division is the attainment of extensive distinctness and completeness.

The *principle* of division is that attribute of the class divided in reference to which the division is made. The members of the class divided differ with regard to the principle of division, otherwise no division could be made. Thus, angles may be divided with respect to their magnitude into right and oblique, and oblique angles, into acute and obtuse.

As to the *number of members*, a division is either a *dichotomy*, having two members, or a *polytomy*, having more than two members. A polytomy is a *trichotomy*, a *tetrachotomy*, etc., according as it has three, four, etc., members. Strictly speaking, every logical division gives a dichotomy, and this is true, though the class can be divided into three, four, or an indefinite number of members. Thus, the class polygons, which can be divided into triangles, quadrilaterals, pentagons, etc., can also be divided into polygons having three sides, or triangles, and polygons having more than three sides; and the latter class can be divided into polygons having four sides, or quadrilaterals, and polygons having more than four sides, and so on.

The two members of a dichotomy agree in exhibiting

the characteristics of the class divided, and, taken together, include every thing of that class; but they disagree in respect to the characteristics of the members. Every thing of the class divided is referred to one or the other of the members, and if included in either, is excluded from the other, and if excluded from either, is included in the other. Thus, since angles are divided into right and oblique, any angle is either right or oblique; if it is one, it is not the other, and if it is not one, it is the other.

The *name* of an object, whether an individual or a class, is the word employed in its designation. Language plays an important part in thinking—it is the product, the instrument, and the embodiment of thought.

The *definition* of an object is such a description of it as will distinguish it from all other objects. An object is defined by referring it to the class immediately containing it, and distinguishing it from all other objects of that class by means of its characteristic attributes. Thus, a triangle is a polygon of three sides.

A species may be *ideated* and represented by the imagination as a collection of individuals; and a genus may be ideated as a collection of species.

The *laws* of genera and species are the following:

(1) Inclusion in a species is inclusion in the genus embracing the species. Thus, since the species acute angles is embraced in the genus oblique angles, if an angle is acute, it is oblique. Let the following laws be illustrated.

(2) Inclusion in a species is exclusion from any thing from which the species is excluded.

(3) Inclusion in a genus is not necessarily inclusion in a given species of that genus.

(4) Inclusion in a genus is disjunctive inclusion in the species of the genus.

(5) Exclusion from a genus is exclusion from all the species of that genus.

(6) Exclusion from a species is not necessarily exclusion from the genus embracing the species.

(7) Exclusion from all the species of a genus is exclusion from the genus.

(8) Whatever can be universally predicated, affirmatively or negatively, of any class, can, in like manner, be predicated of any thing contained in that class.

**3. Rules for the attainment of success in reflection.**

1st. To avoid distraction, abstract the thoughts completely from irrelevant phenomena.

2d. To secure clearness, let the attention be concentrated and persistent.

3d. To secure distinctness, make an accurate analysis of the phenomenon, or an exhaustive division of the class.

4th. To understand the object as a whole, recombine, by a comprehensive synthesis, the elements found by analysis, or by a perfect generalization, ascend to the class from the subdivisions found by division.

5th. To understand the relations of an object to other objects, perform carefully the related processes of comparison, identification or discrimination, and classification.

6th. To secure a comprehensive knowledge of the facts of the soul, go over, according to the above directions, all the phenomena revealed in consciousness, making an accurate record of the results.

**4. Difficulties encountered in reflection.**

1st. The phenomena to be observed, unlike the objects of the material world, are fleeting, and vanish as we attempt to gaze upon them.

2d. They must, if past, be reproduced and represented as ideas; but the representative idea of a phenomenon

is but a substitute, more or less imperfect, for the phenomenon itself.

3d. Only one observer is possible. The testimony of others as to corresponding phenomena in their own consciousness, though serving as a check on hasty conclusions, is not to be taken as decisive till verified by individual experience.

4th. The introspective method of consciousness and reflection, in its persistent, careful, and comprehensive form, is a difficult operation, and perfection in the art of reflection is a rare, as well as a valuable attainment.

## CHAPTER III.

### RATIONAL INTUITION.

**1. Rational intuition, as an act, a product, and a faculty.**—As an *act*, rational intuition is the immediate apprehension of necessary truth. It differs from empirical intuition in the character of its object, and in the mode of its knowledge. Empirical intuition is the consciousness of contingent phenomena. Rational intuition is the apprehension of necessary truth.

It is true that all knowledge *begins* with the experience of phenomena; but phenomena imply conditions—a subject, an object, and the synthesis of subject and object. By the act of rational intuition, the intellect apprehends, not only that phenomena, but that events in general, whether they appear or not, are impossible without conditions; that is, that conditions are necessary to the occurrence of events. For, without conditions, events would be cut off from dependence on any thing else; hence, before their occurrence, having no relation to any thing antecedent, they would be nothing, and their occurrence would imply that nonentity springs into entity, which is impossible, since nonentity can not spring. *Ex nihil, nihil fit.* Hence, events without conditions are impossible; but the impossibility of events without conditions is the necessity of conditions to the occurrence of events.

The *objects* apprehended by rational intuition are necessary truths; these truths are not the conditions of events, but they are the necessity of these conditions,—

not their absolute necessity, that is, their necessity in themselves, irrespective of all other realities, but their conditional necessity, that is, their necessity on the condition of the occurrence of the events. Necessary conceptions are also said to be objects of rational intuition; but since necessary conceptions are resolvable into necessary judgments, or truths, it will suffice to say that the objects of rational intuition are necessary truths.

The knowledge of events is the *chronological antecedent* of the rational intuition apprehending the necessity of their conditions. Thus, we know an event before we apprehend the necessity of its cause. The conditions whose necessity is apprehended by rational intuition are the *logical antecedents* of the events known by experience. Thus, space is the logical antecedent, or necessary condition of body; time is the logical antecedent of succession, and cause of events.

As *products*, rational intuitions are the cognitions embodying necessary truths. These products have received various names, as *axioms*, *first principles*, *forms of thought*, *regulative principles*, etc.

As a *faculty*, rational intuition is the power of apprehending necessary truth. This faculty has received various designations, as *reason*, *common sense*, *the regulative faculty*, etc.

**2. Origin of rational intuitions.**—The following theories have been proposed to account for the origin of rational intuitions as products:

1st. *Intuitions are derived from the experience of the individual.* It is true that all knowledge begins with the experience of phenomena; that intuitions, as products, are phenomena, and are, therefore, the objects of consciousness; and that they harmonize with all experience. But the necessity implied by the act of intuition, not the subjective necessity of apprehension, but the objective

necessity apprehended, is not an object of consciousness, nor is it derived from experience. Cause, for example, transcends experience; but its necessity is apprehended by the act of rational intuition, on the condition that the mind has knowledge of the reality of an event.

2d. *Intuitions are derived from the experience of the race.* According to this theory, that which has been found by experience to be universally true, has been so impressed on the race that the tendency to believe it has been transmitted in the form of necessary belief called intuition. This theory concedes the fact that this belief seems to the individual to be intuitive, though asserting that it was originally derived from experience. There are, however, many things known by experience, as the successive phases of the moon, which, though conformable to universal experience, are never considered as known by rational intuition, since they are destitute of the character of necessity. Experience deals with contingent phenomena; but rational intuition apprehends the necessity of their conditions.

3d. *Intuitions are innate.* According to this theory, intuitions are born with us, ready for use as occasion may require. It is evident, however, that, though the intuitive faculty is innate, intuitions, as products, are not innate. In all knowledge there is a subjective factor which is supplied by innate power. Intuitions, as products, are judgments expressing the necessity of the conditions of events, and can not, therefore, exist prior to the experience of events, and hence can not be innate.

4th. *Intuitions are the products of a rational faculty.* This is the true theory. On the condition that phenomena are experienced in consciousness, the rational power, by direct insight, apprehends the necessity of their conditions. The intuitive power acts whenever the conditions of its action are present. Thus, whenever

there is knowledge of the occurrence of an event, rational intuition apprehends the necessity of its cause.

**3. Criteria of rational intuitions.**—These are the following:

1st. *Self-evidence.* Their truth is apprehended as self-evident by the immediate insight of the intuitive power.

2d. *Logical priority.* They are not derivable. Since they are immediately apprehended, they need no proof. In fact, there is nothing clearer from which they can be derived; hence, they possess the characteristic of logical priority.

3d. *Universality.* Intuitions are universally accepted, if not consciously, as abstract principles, yet unconsciously in concrete applications. A person may not be able to grasp, in its utmost generality, the full meaning of the proposition, *Every event must have a cause;* yet he seeks for the cause of a particular event of which he has experience, thus assuming that it has a cause, and, virtually, that every event has a cause. Another meaning may be assigned to the universality of intuitions—they are true at all times and in all places.

4th. *Necessity.* Intuitions, as acts, apprehend their objects as necessary, and their contradictories as impossible. As products, they are necessarily true. The intellect is also necessitated to affirm them, by the constitution of the intuitive power.

**4. Conditions of rational intuitions.**—These are the following:

1st. The *objective* condition—the reality whose necessity is the object of intuition. The act is impossible without the object. The reality of the object is involved in its necessity.

2d. The *subjective* condition—the innate power to apprehend the necessity of the reality. The act is impossible without the power.

3d. The *empirical* condition — the experience of a phenomenon in consciousness, or in general, the knowledge of an event. An event being known, the innate power of intuition apprehends, by direct insight, the necessity of its conditions.

**5. Reality and validity of rational intuitions.** — The *reality* of intuitions is attested by consciousness, but not the validity. We know by consciousness that intuitions are *actual*, not that they are *true*. The validity of intuitions is thus shown:

1st. The common sense of mankind asserts their validity.

2d. They never conflict, but always harmonize.

3d. They are free from the usual sources of error, since they are not deductions from complicated processes, but are immediate apprehensions of the intuitive power.

4th. If they are not valid, our faculties are deceptive, and knowledge is impossible.

5th. Demonstration implies the validity of intuitions. There is either an ultimate basis or an infinite series of dependent propositions. But there can be no demonstration by means of an infinite series of dependent propositions; for, to prove one proposition by others, and those by others, and so on in a regressive series, *ad infinitum*, would require infinite time, and is, therefore, impossible. Hence, demonstration implies an ultimate basis. Now, this basis, being ultimate, is not derived through any thing else. It must, therefore, be an assumption, without evidence, or an intuition. It can not be an assumption, for then it would not be known to be true, and might be false, and demonstration would be impossible. The ultimate basis, must, therefore, be an intuition; and the demonstration is valid only on the condition that the intuition is valid. Hence, the validity of demonstration implies the validity of intuition.

The above proof is not absolute; but it shows that if

demonstration is possible, intuitions are valid. We are not, however, authorized to demand assent to a proposition on the ground that it is an intuition, unless it exhibits the *tests* of an intuition, as given in the criteria.

An intuition is not a chimera, but is a valid judgment; hence, the falsity of the opinion of *Diderot*, that: "In the last analysis, every idea is resolved into a representative picture addressed to the senses; and since every thing in our understanding has come to it through sensation, so every thing from the understanding, which can not reattach itself to some sensible archetype, is chimerical and void of meaning. Hence, it is an important rule in philosophy, that every expression for which we can not find an external and sensible object must be rejected as having no significance."

To the maxim, "There is nothing in the intellect which was not before in the sense," Leibnitz added, "except the intellect itself;" and it may also be added, except intuitions with their logical consequents.

**6. Summary statements.** — By the act of the faculty of rational intuition, the intellect immediately apprehends fundamental necessary truth, and embodies the product in the form of a judgment.

Events are known by experience; but the impossibility of events without conditions, or the necessity of conditions to the occurrence of events is known by rational intuition.

The experience of events is the chronological antecedent of the intuition of the necessity of conditions. But the conditions are the logical antecedents of the events.

Intuitions are not derived from the experience either of the individual or of the race, neither are they innate, but they are the products of a rational faculty.

The criteria of rational intuitions are self-evidence, logical priority, universality, and necessity.

The conditions of rational intuitions are necessary re-

ality, the innate power of intuition, and the experience of phenomena.

The reality of intuitions is attested by consciousness; but their validity is maintained by common sense, by their harmony, by their freedom from the usual sources of error, by the veracity of our faculties, by the requisites of knowledge, and by the fact of demonstration.

**7. Classifications of conditions.**—Conditions are classified as *non-dynamical* — those not involving power, and *dynamical*—those involving power. Non-dynamical conditions are divided into *universal* and *special;* and dynamical conditions, into *substance* and *cause.*

## CHAPTER IV.

### INTUITIONS CONTINUED.

**1. Universal conditions.** — The *universal* non-dynamical conditions are those implied by every phenomenon. They are divided into the negative condition and the positive conditions.

1st. The *negative condition* is the absence of counteracting influences. The occurrence of any event implies the absence of preventing causes. Thus, the fall of a body implies the absence of support.

2d. The *positive conditions* are time and space.

(1) *Time* is that in which things persist or succession takes place. The fact of succession, that phenomena appear, vanish, and are followed by other phenomena, as attested by consciousness, implies time, or that in which succession takes place. Intuition apprehends the impossibility of succession without time, or the necessity of time as a condition of succession.

Any phenomenon involves the date of its occurrence and the duration of its continuance. The date answers the question, *when?*—the duration, the question, *how long?* The date determines the time of the occurrence; the duration measures the period of the continuance.

Any number of events may have the same date and duration; hence, no event excludes another from the time through which it continues. Two events are simultaneous if they have the same date and duration; they are successive, if one precedes and the other follows immediately or after an interval more or less prolonged.

The *present* is that moment, inappreciably small in duration, which separates the past, or time that has been, from the future, or time that will be. As the moment of division between the past and the future, the present perpetually vanishes into the last moment of the past, and is instantly renewed by the first moment of the future. Hence, the present is virtually a moving date; for it has coincided, in succession, with every date of past time, and it will coincide, in succession, with every date of future time. In consequence of the movement of the present, the period from any past date to the present is continually increasing, and the period from the present to any future date is continually decreasing; hence, the past receives continual increments, and the future suffers continual decrements. The present is the only time that *is;* the past has vanished; the future has not yet come.

The *necessary truths* pertaining to time, as apprehended by rational intuition, are the following:

1) Time is that in which things persist or succession takes place. As the condition of persistence and succession, subjective and objective, time is not only a form of thought, but it is an objective reality.

2) Time has three divisions—the past, the present, and the future.

3) There is no date in past time not preceded by a previous date, and no date in future time not succeeded by a subsequent date; hence, the past has no beginning and the future no end; that is, time is not finite, and is, therefore, infinite.

4) The present, as a moving date, has coincided, in succession, with every date in past time, and will, in like manner, coincide with every date in future time; it is perpetually the termination of the past and the beginning of the future; and, though an infinitesimal in duration, it pervades all space, and hence is omnipresent.

5) Having no beginning, time was never created, and having no end, it will never be destroyed; it is neither a cause nor an effect; it neither exerts nor receives energy. The statement, "Time works great changes," is *poetic*, not philosophic. Causes effect changes in time. Were every thing in time annihilated, time itself would remain an absolute void.

6) The one infinite time is homogeneous, continuous, and infinitely divisible, and contains all the different periods of time; and these periods are not simultaneous but successive, and their dates are relatively fixed.

7) Events occur in time and are simultaneous or successive; and successive events, though otherwise alike, may be distinguished by their dates, which are relatively fixed.

8) Time is not directly measurable in itself, but is indirectly measurable by motion.

9) As a condition of succession, time is a condition of all mental or physical activity, and is, therefore, a condition of every art, science, or product of human thought or effort.

(2) *Space* is that in which bodies are situated and motion takes place. Bodies imply space as their necessary condition. But how did we reach the idea of body as an extended thing? In endeavoring to account for this, let us begin with the experience of a simple sensation, which, if it be unextended—that is, if it does not occupy space, is nevertheless located, that is, it is situated somewhere in space. Like a point, it has position, if not magnitude. The location of a sensation is, however, not always clearly apprehended, even after the idea of space has been developed, but, prior to this, is not apprehended at all. A succession of sensations, though eliciting the idea of time, does not evoke that of space.

The discrimination of similar simultaneous sensations,

by an act of reflection, is a fact whose reality is attested by consciousness. But how is this discrimination possible? The rational mind, guided alone by the idea of time, could not account for the fact, but would decide that the sensations ought to blend together as one indistinguishable sensation. They are, however, discriminated as two sensations. Rational intuition, in its endeavor to account for the possibility of the discrimination, apprehends the necessity of their reciprocal externality. The impossibility of discriminating such sensations, if located at the same point, is the necessity of their reciprocal externality, as the condition of their discrimination.

Sensations, as reciprocally external, reveal an extended sensorium; and the sensorium, as extended, leads to the knowledge of the organism, or body, as extended. Admitting the existence of our own bodies as extended, we are not warranted in denying the existence of other bodies, as also extended. But body, as extended, implies space, or that in which the body is situated, as its necessary condition.

A body, as extended, occupies space, and excludes other bodies from the space which it occupies. A body not only occupies space, but is surrounded by space on all sides, since another body may be external to the first, on any side of it, and this other body occupies space.

Space is the condition of motion as well as of body; and since motion is possible in any direction, and, by familiar experience, is found to be actual, space extends indefinitely in all directions.

The *necessary truths* pertaining to space, as apprehended by rational intuition, are the following:

1) Space is that in which bodies are situated or motion takes place. As a condition of body and motion, space is not only a subjective form of thought, but is an objective reality.

2) Space has three dimensions—length, breadth, and thickness.

3) Space has no limit beyond which there is no space; hence, space is not finite, and is, therefore, infinite.

4) Space, though infinite in extent, exists in the infinitesimal present, which is a moving date; hence, space persists throughout infinite time, and is, therefore, eternal.

5) Having no beginning, space was never created, and having no end, it will never be destroyed; it is neither a cause nor an effect; it neither exerts nor receives energy. Were every thing in space annihilated, space itself would remain an infinite and absolute void.

6) The one infinite space is homogeneous, continuous, and infinitely divisible, and contains all the different portions of space; and these portions are not successive, but simultaneous, and their positions are relatively fixed.

7) Bodies exist in space, and are at rest or in motion, and those otherwise alike may be distinguished by their positions, which are not relatively fixed.

8) Space is directly measurable in itself, and indirectly measurable by motion.

9) As a condition of body and motion, space is a condition of every thing involving body or motion.

Let these statements be compared with the corresponding ones concerning time.

Space is a *subjective law of thought* in this sense,—that we are under the necessity of thinking that bodies are contained in space; but it is an *objective reality* in this sense,—if there were no mind, space would still be the room in which bodies might exist and move.

Space, then, is not nothing; it is extension. It may be said with Prof. Bowne, *Metaphysics*, page 182: "If this distinction between space and nothing is to be maintained, space must be able in some way to assert itself as a determining factor in the system of things.

No matter how nameless or ineffable a substratum we may assume for space, this demand can not be escaped." The reply is, that *being*, in the sense of substance involving power, is not the highest genus in the universe of realities, for *reality* itself is a higher genus, embracing both non-dynamic reality with its subdivisions, space, and time, and dynamic reality with its subdivisions, matter and spirit. To say all reality is dynamic is to beg the question at issue, by assuming that which is neither self-evident nor capable of proof, but which contradicts one of the clearest of our rational intuitions.

**2. Special conditions.** — The *special* non-dynamical conditions are the conditions of valid thought and the guarantees of truth. They are the *fundamental laws* of thought and the *axioms* of the various sciences.

The *form* of an intuition is a judgment, and the expression of a judgment is a proposition. A judgment arises from a comparison of two objects of thought, and the proposition expresses the decision of the judgment, by affirming or denying that a certain relation exists between these objects.

As to *nature*, a proposition is analytic or synthetic. An *analytic* proposition is one which affirms what is involved in the mere conception of the subject, or denies what conflicts with such conception. Thus, a body is extended; the whole is the sum of the parts; a square is not round, etc. A *synthetic* proposition is one which affirms what is not involved in the mere conception of the subject, or denies what is not inconsistent with such conception. Thus, an ellipse is a conic section. This body is not hard.

As to *relation*, any two propositions are congruent or conflictive, and conflictive propositions are contraries or contradictories.

*Contrary* propositions are conflictive propositions which

are not universally inclusive — other conflictive propositions relating to the same things being possible. Thus, the propositions, *a* is equal to *b*, and *a* is less than *b*, are contraries, since they are conflictives, and another proposition, *a* is greater than *b*, is possible.

*Contradictory* propositions are conflictive propositions which are universally inclusive — no other conflictive propositions of the kind, relating to the same things, being possible. Thus, *a* and *b* are equal, and *a* and *b* are unequal.

1st. The *fundamental laws* of thought relate either to the harmony of thought or to the sequence of thought.

The laws relating to the *harmony* of thought are the following:

(1) *The law of identity.* This law is variously stated, positively and negatively, thus: *A thing is itself; a thing is not any thing else* than itself. *A* is *A*; *A* is not *non-A*. A thing is what it is; a thing is not what it is not. The whole is equivalent to the sum of all its parts; the whole is not inequivalent to the sum of all its parts.

The law of identity has a special application to a definition, the subject and predicate of which are identical in fact, though not in expression, since what is involved in the subject is evolved in the predicate.

*Consequence.* What is involved in any thing may be affirmed of that thing, and any thing conflictive may be denied.

(2) *The law of congruents. The congruity of two propositions is consistent with the truth of both, with the falsity of both, or with the truth of either and the falsity of the other.* Thus, *a* and *b* are unequal, and *a* is greater than *b*, are congruents. Both are true, if *b* is less than *a*; both false, if *b* is equal to *a*; one true and the other false, if *b* is greater than *a*.

*Consequence.* From mere congruence, the truth or

falsity of either of two propositions can not be inferred from either the truth or the falsity of the other.

(3) *The law of conflictives. Two conflictive propositions can not both be true.* For, whether contraries or contradictories, they are incompatible; hence, if both were true, the truth of each would involve the falsity of the other, and both would be false; then each is both true and false, or a truth is a falsity, which contradicts the negative part of the law of indentity—that a thing is not any thing else than itself. Thus, the propositions, this tree is an oak, and the same tree is a walnut, are conflictives, and both can not be true.

*Consequences.* 1) If one of two conflictives is true, the other is false. 2) Two true propositions can not be conflictive. 3) All truths exist in harmony. 4) A proposition is false, if it involves the conflictive of a truth.

The law of conflictives is commonly called the *law of contradiction.* It follows as a corollary from the negative part of the law of identity. As a law of the genus *conflictives*, it is applicable to both species, contraries and contradictories, which also have special laws.

(4) *The law of contraries. Two contrary propositions can not both be true, but may both be false.* For since they are conflictives, both can not be true; and since they are contraries, they are not universally inclusive; hence, other cases are possible, and both may be false. Thus, the propositions, *a* is equal to *b*, and *a* is greater than *b*, are contraries; both can not be true, but both may be false, since *a* may be less than *b*.

*Consequences.* 1) The truth of either of two contraries involves the falsity of the other. 2) The falsity of either of two contraries does not involve the truth of the other.

(5) *The law of contradictories. Two contradictory propositions can not both be true, nor both false.* For, since

they are conflictives, both can not be true; and since they are contradictories, they are universally inclusive; hence, no other cases are possible, and both can not be false. Thus, the propositions, *a* and *b*, are equal, and *a* and *b* are unequal, are contradictories; both can not be true, nor both false.

*Consequences.* 1) One of two contradictories is true and the other false. 2) The truth of either of two contradictories involves the falsity of the other. 3) The falsity of either of two contradictories involves the truth of the other.

The law of contradictories is commonly called the *law of excluded middle*, since any middle supposition is excluded.

This law has a special application to the two propositions, one affirming that an object of a genus belongs to one of the two contradictory species of a genus, and the other affirming that it belongs to the other species. Thus, let *A* be a genus divided into the two contradictory species, *B* and *C*, and let *D* be an object in *A*. Then, the propositions, *D* is *B*, and *D* is *C*, are contradictories; hence, *D* is either *B* or *C;* if it is one, it is not the other; and if it is not one, it is the other. Thus, since the genus *propositions* may be divided into the contradictory species, true propositions and false propositions, any proposition is either true or false; if it is true, it is not false; and if it is false, it is not true. What is involved in a true proposition is also true; but what is involved in a false proposition may be either true or false.

The truth of the laws of harmony has been denied by certain philosophers, notably by Heraclitus and Hegel. Thus, Ferrier, in his *History of Greek Philosophy*, says, in his article on *Heraclitus:* "Opposite determinations are not only compatible in the same object, but they are

even necessary to the constitution of every object. . . . How does a thing get out of one state into another? Because, says Heraclitus, in being in the state in which it is, it is already out of it. Being in it is being out of it; and being out of it is being in another. . . . . The two moments, the moment of being in it, and the moment of being out of it, are one, and constitute one indivisible conception of becoming. . . . .

"Suppose the changing states of an object to be represented by *A*, *B*, *C*, *D*, *etc.* The state *A* appears, and in appearing disappears. *A's* disappearance is the appearance of *B*, which, in like manner, disappears in the very act of appearing; but *B's* disappearance is the appearance of *C*, which no sooner appears than it vanishes into *D*, and so on. Now, here the moments of being and not being are inseparable. *A's* being is *A's* not-being; *A's* not-being is *B's* being; *B's* being is *B's* not-being; *B's* not-being is *C's* being, and so on.

"Let us try the other alternative — *A's* being is not *A's* not-being, because, on this supposition being and not-being are held asunder as separate conceptions; and neither is *A's* not-being, or disappearance, *B's* being, or appearance. Our supposition is, that appearance, or being, and disappearance, or not-being, are separate concepts, and, therefore, we must not suppose that the disappearance of *A* is the appearance of *B*. . . . . What, then, happens? This happens, that there is an interval between the appearance or being of *A* and the appearance or being of *B*, in which the thing is in no state at all. . . . . And this is the ridiculous and contradictory conclusion to which we are driven, if we suppose change to take place by leaps, and that being and not-being, instead of being mere elements of one indivisible conception, are themselves distinct and completed conceptions."

This view arises from a misconception of what the

laws of harmony require. Absolute being and absolute not-being are certainly incompatible; so also are the being of *A*, and, at the same instant, the not-being of *A;* but the not-being of *A* is not incompatible with the being of *B*, though not identical with it, since in place of the being of *B*, there might be the being of *C*, or of *D*, or of *E*, etc.

There is truth in the view of Heraclitus that things do not remain for a definite time in a fixed state, and then change by a sudden leap. The change is continuous, though the rate of change may be variable. But it is not true that a thing is in a state and not in that state precisely at the same instant. The thing, however, does not rest in that state, but passes through it.

It is easy to reduce the Heraclitean view to an absurdity. Thus, to take a case chosen by Ferrier himself, let the temperature of water, at the successive moments, as it is raised from the freezing to the boiling point, be denoted by *A*, *B*, *C*, *D*. . . . . Then, according to Ferrier, "*A's* being is *A's* not-being; *A's* not-being is *B's* being; *B's* being is *B's* not-being; *B's* not-being is *C's* being, and so on." Also, according to this view, the water in the state *A* is already out of it. "The two moments, the moment of being in it, and the moment of being out of it, are one;" and since "being out of it is being in another," the water is in the states *A* and *B* at the same moment. For like reasons, it is, at the very same moment, in the states *B* and *C*, and, at precisely the same moment, in the states *D*, *E*, *etc.*, to the boiling point. Hence, the water is freezing and boiling at the very same moment, and at the same time has all intermediate temperatures!

This consequence is fairly deduced from the premises; whereas the absurdity, that a body is, for a time, in no state at all, was deduced by Ferrier on the false assump-

tion that the law of identity requires us to hold that *not-A* is incompatible with *B*.

The laws relating to the *sequence* of thought, called the laws of *Reason and Consequent*, are the following:

(1) *No judgment is warranted without a sufficient reason.* We know by intuition that a reason is necessary to warrant a judgment, but not what the reason is, unless the judgment is intuitive.

(2) *To affirm the reason is to affirm the consequent.* Thus, to affirm that *A* has the fever is to affirm that he is sick.

(3) *To deny the consequent is to deny the reason.* Thus, to deny that *A* is sick is to deny that he has the fever.

(4) *To deny a particular reason is not to deny the consequent, but to deny every reason is to deny the consequent.* Thus, to deny that *A* has the fever is not to deny that he is sick, since he may have some other disease; but to deny every disease is to deny that he is sick.

(5) *To affirm the consequent is not to affirm a specified reason, but it is to affirm some reason.* Thus, to affirm that *A* is sick is not to affirm that he has the fever, but it is to affirm that he has some disease.

The reason may be simply the reason of knowing—*ratio cognoscendi*, or it may also be the reason of being—*ratio essendi;* but the laws of sequence are concerned only with the reason, as the reason of knowing, and not with the reason, as the reason of being, or the *cause*, which is a dynamical condition.

2d. The *special axioms* of the various sciences may be illustrated by those of Geometry, the fundamental axiom of which is the following:

*Either of two magnitudes identical in any respect is, in that respect, a substitute for the other.*

By remembering that similar magnitudes are identical in form, that equivalent magnitudes are identical in extent, and that equal magnitudes are identical in both

form and extent, this fundamental axiom can be explicated into three special axioms.

(1) *The axiom of similarity. Either of two similar magnitudes is, in respect to form, a substitute for the other.*

(2) *The axiom of equivalency. Either of two equivalent magnitudes is, in respect to extent, a substitute for the other.*

(3) *The axiom of equality. Either of two equal magnitudes is, in respect to both form and extent, a substitute for the other.*

The ordinary so-called axioms of Geometry may be deduced from the above as corollaries. [See *Schuyler's Geometry, Art.* 23.]

The act of *substituting* one thing for another, renders an advance in thought possible; and substitution, according to the axiom, is always legitimate when the two magnitudes are identical in respect to the attributes under consideration.

The special axioms may also be illustrated by the fundamental axiom of Ethics — *Benevolence is the primal duty.* The necessity of benevolence as the condition of the performance of duty is a rational intuition.

## CHAPTER V.

### INTUITIONS CONTINUED.

**1. Substance.** — *Substance* is the substratum or underlying power which manifests conjoined properties or qualities.

*Attributes* are the conjoined properties or qualities which are manifested by a substance.

Attributes are known by *experience.* Substance itself does not appear — it is not a phenomenon; but on the condition of the manifestation of its attributes, its necessity is apprehended by *rational intuition.* Attributes imply substance as their ground or source; and substance involves attributes as the modes of its existence. Attributes are not the manifestations of nothing, but of underlying power capable of manifesting them. The fact that attributes are conjoined in groups is explained by their dependence on a common substance, but is otherwise inexplicable. A substance must have attributes, though not necessarily a specified attribute; for, if it exist at all, it must exist in some way, and the modes of its existence are its attributes. A substance, through the action of other substances, may change its manifestations; but the substance of the material universe can not be augmented or diminished, except, *ab extra*, by supernatural agency, and the manifestation of attributes, without substance, is impossible.

A *thing* is a substance with its conjoined attributes. It is contained in space, and has date and duration in

time. The general attributes of things are quantity, quality, relation, and modality.

A thing has *quantity* involving *unity*, when regarded as one whole; *plurality*, when regarded as a substance with a multiplicity of attributes; *totality*, when regarded as the sum of the substance and conjoined attributes.

A thing has *quality* involving *existence* and *identity*. *Existence* as opposed to non-existence involves *reality* as opposed to *non-reality*, *something* as opposed to *nothing*, or *entity* the negation of *non-entity*. It is not possible for a thing to be and, at the same time, not to be. *Identity*, or the fact that a thing is itself and nothing else, involves *peculiarity*, or the positive attributes characteristic of the thing, and *particularity*, or the negative of the positive characteristics peculiar to other things, though it may have other attributes in common with those things.

A thing has *relation*, involving the inherence of its attributes in the substance in perpetual time; *causality*, when it is the cause of an effect, or the effect of a cause in successive time; *reciprocity*, when acting or reacting in simultaneous time.

*Modality* is the view of a thing taken by the mind as influenced by the evidence relating to its reality. It embraces the following couples: *Necessity*, when the thing must be, or *contingency*, when the thing is actual or possible, but not necessary; *probability*, when the evidence of its reality overbalances the evidence of its unreality, or *improbability*, when the evidence of its unreality overbalances the evidence of its reality; *possibility*, when the evidence does not absolutely exclude its reality, or *impossibility*, when the evidence absolutely excludes its reality; *certainty*, when the evidence excludes doubt, or *uncertainty*, when the evidence does not exclude doubt.

Substance is divided into matter and spirit. *Matter* is an extended substance. It occupies space, and is contained in space, and continues in time. As occupying space, it has magnitude, and form, and ultimate incompressibility. As contained in space, it has location and mobility. As continuing through a period of time, it has date and duration. *Spirit* is that substance which is endowed with intellect, sensibility, or will. If a spirit does not occupy space, it is nevertheless contained in space, and has locality and mobility. As contained in time, a spirit has date and duration.

It follows, from the fundamental laws of thought, that two congruent attributes may both be present in the same thing, or both absent, or either may be present and the other absent, and that the presence or absence of either does not involve either the presence or the absence of the other; that two conflictive attributes can not both be present in the same thing, and that if either is present, the other is absent; that two contrary attributes can not both be present, but may both be absent, that the presence of either involves the absence of the other, but that the absence of either does not involve the presence of the other; that two contradictory attributes can not both be present in the same thing, nor both absent, that the presence of either involves the absence of the other, and that the absence of either involves the presence of the other.

**2. Cause.**—A *cause* is that which produces an event. An *event* is that which comes to pass or takes place. It is a change either in the elements of a thing or in its relations to other things. An *effect* is an event produced by a cause.

1st. *Kinds of causes.* Aristotle distinguishes four kinds of causes—formal, material, efficient, and final.

The *formal* cause of a thing is the essential character-

istic which distinguishes it from other things. Thus, the *plan* of a house is its formal cause, since it distinguishes it from other objects.

The *material* cause is the matter out of which a thing is made. Thus, *iron* is the material cause of a stove.

The *efficient* cause is the force, energy, or exertion of power which produces a thing, or changes its place or state. Thus, a *blow* from a bat is an efficient cause which will change the direction of a moving ball.

The *final* cause is the end or purpose which the thing is designed to subserve. Thus, *vision* is the final cause of the eye.

A cause is said to be *imminent* when it exists and operates within the thing itself. It is identical with the formal cause.

A cause is *transcendent*, or *transeunt*, when it goes beyond that in which it inheres and acts upon other things, *ab extra*. It is identical with the efficient cause.

The word *cause* is sometimes used to denote simply an immediate and invariable antecedent, exclusive of the idea of efficiency. This view improperly identifies cause with a non-dynamical condition, and resolves the relation of cause and effect into that of antecedence and consequence, that is, into a law of sequence. Thus, a law of nature is a general fact embracing a multitude of particular facts. A law when known enables us to predict the particular fact. It is not a cause of the facts, but a cause of our knowing them — not a *ratio essendi*, but a *ratio cognoscendi*.

The word cause is also used improperly in the sense of instrument, as when it is said, a pistol was the cause of the man's death. The pistol was the instrument, while the one who fired it was the cause.

The signification of the word cause is sometimes enlarged so as to embrace, not only that which is efficient

in producing the event, but also all antecedent conditions, whether dynamical or non-dynamical; in short, whatever is necessary to the occurrence of the event. Thus, Mill says: "The cause, philosophically speaking, is the sum total of the conditions, positive and negative, taken together; the whole of the contingencies of every description, which, being realized, the consequent invariably follows."

It is best, however, to restrict the application of the word *cause* to those dynamical conditions which conspire to produce an event, and to employ the word *conditions* to signify all necessary antecedents, both negative and positive, including the cause.

According to this view, a cause is a condition, that is, it is indispensable to the event; but a condition is not necessarily a cause. Thus space is a condition but not a cause of motion. The relation of cause to condition is that of species to its genus. Cause is that dynamical condition which produces an event.

Of the various senses of the word cause, the *efficient cause* is the one which corresponds to the popular notion, and this is the sense in which the word is here used. By using the word *condition* to denote any necessary antecedent, positive or negative, dynamical or non-dynamical, and the word *cause* to denote the sum total of the dynamical conditions, the philosophical and popular significations of these terms are brought into harmony, which is a result greatly to be desired.

Causes are to be distinguished from *reasons*, which as intellectual, moral, or spiritual influences, are either the grounds of inference or the motives for volition.

As grounds of inference, reasons influence the judgment, and, according to their strength, warrant the conclusion as probable or certain.

As motives of volition, reasons, though causes of

desires, are conditions but not causes of volition. They solicit, but do not compel volition. The cause of volition is the will itself. When several forces, as causes of motion, act upon a body, the effect is the resultant of the combination of causes; but when different motives solicit action in different directions, the will, in deciding to act in accordance with the solicitations of one of these motives, sets aside the others. Volition is, therefore, not the resultant of motives, but is the act of the will in view of motives.

Effects, as events, are known by experience. An event being known by experience, the conditional necessity of a cause as that which produced the event, is known by rational intuition. That there is a cause is known by intuition; what the cause is, is known by investigation.

An event being given, its cause is necessary; but the supposed event not being a reality, either the cause or some other antecedent is not only not necessary, but not actual; for if all the antecedent conditions, including the cause, were actual, the event would be necessitated. The cause is, therefore, not absolutely, but conditionally necessary — it is necessary on the condition that there is an event.

An event, as known by experience, is regarded as contingent; but the cause and all other antecedent conditions being given, the event is necessary; that is, the character of the cause and other conditions determines the nature of the effect; but since the cause is not absolutely necessary, the event is not absolutely necessary.

2d. *Laws of causality.* These are the following:

(1) Every event must have a cause.

(2) The effect is always complex.

(3) The cause is always complex.

(4) The complexity of the cause is proportionate to the complexity of the effect.

(5) Like causes and conditions are followed by like effects.

The first of these laws is, *Every event must have a cause;* that is, every event is an effect. This law is sometimes stated, Every effect must have a cause; but this statement is tautological; for, by definition, an effect is that which is produced by a cause; hence, the statement, Every effect has a cause, is equivalent to the statement, Every thing which is produced by a cause is produced by a cause. But an event is that which comes to pass or takes place; and though it is true that every event has a cause, yet this is not implied in the word itself.

The *theories* concerning the origin of the first law, regarded as a causal judgment, are the following:

1) *This judgment has its origin in the perception of cause.* The first objection to this theory is that we have no such perception. This is now generally admitted. We perceive an event, but not the energy which produces the event.

The second objection is that, if we had such a perception, it could not, as a matter of experience, relating only to particular cases, account for the universality and necessity found in the judgment of causality — that every event must have a cause.

2) *The casual judgment has its origin in a consciousness of causal efficiency.* It is true, for example, that we are conscious of the volition to move the hand; that we are conscious of making an effort to move it; and that we are conscious of perceiving the hand move; but we are not conscious of the mode in which the effort produces the effect. We know not what intermediate agencies there may be between the effort and the effect.

In the consciousness of effort, we find that there is something more in cause than mere antecedence. Here, perhaps, we have consciousness, not of cause or power

itself, but of the exertion of the power in a particular case, though not of the mode of its producing the effect. But this does not account for the universality and necessity found in the judgment of causality.

3) *The judgment of causality is attained by induction.* According to this theory we find that events have causes in particular cases, and hence infer that they have causes in all cases. But as we do not perceive causes in particular cases, as we have before seen, but only succession, we have no facts to warrant the induction, unless we resolve the relation of cause and effect, as Hume has done, into that of antecedent and consequent. But should we do so, the fact would be, that, so far as observed, every event has an antecedent, or every event is a consequent; hence, by induction, it is inferred that all events, observed or unobserved, have antecedents. But such inductions give us probability only, not necessity. Hence, the causal judgment is not derived from induction, since this judgment affirms, as we shall see, the necessity of an efficient cause, not the probability of an antecedent.

4) *The principle of causality is derived from association or custom.* If this theory be true, the conviction is a growth, and should have degrees; but the conviction is as strong when the law is first apprehended as ever afterwards. Association, custom, or habit can not account for a necessary principle.

5) *The principle of causality is the product of a special faculty.* There is no necessity of referring the causal judgment to a special faculty whose only office is to affirm this judgment; for rational intuition, which affirms the necessity of other *a priori* truths, is competent to affirm this also.

6) *The principle of causality is derived from the expectation of the uniformity of nature.* But this expectation

gives only the probable, not the necessary; and does not, therefore, give us the causal judgment.

7) *The principle of causality is derived from the law of contradiction.* This is impossible; for, though under this law, more properly called the law of conflictives, we can reason from affirmation to denial, yet we can not reason from denial to affirmation.

8) *The principle of causality is derived from the law of the conditioned.* This is the opinion of Hamilton, who derives the principle of causality, not from a *potency*, but from an *impotency* of mind. "It is the inability we experience of annihilating, in thought, an existence in time past, in other words, our utter impotence of conceiving its absolute commencement, that constitutes and explains the whole phenomenon of causality." Bowen's Hamilton's *Metaphysics*, page 554.

It will be observed that Hamilton rejects an absolute commencement on account of its inconceivability; but if an absolute commencement is rejected, a cause for every event must be admitted; hence, there never was a time when there was absolutely nothing, since, on that supposition, there must have been an absolute commencement. Eternal existence is, therefore, a reality; but eternal existence is inconceivable. The mind is impotent to conceive the eternal. Now, if we derive a principle from this impotence, according to Hamilton's method, and reject the fact of eternal existence, because it is inconceivable, we must admit its contradictory — that there must have been an absolute commencement. If an absolute commencement can be rejected on the ground of its inconceivability, and its contradictory affirmed — that every event must have a cause, and hence that there must have been eternal existence, then, certainly, we are authorized to reject eternal existence on the ground of its inconceivability, and to affirm its contradictory — an abso-

lute commencement; but this sets aside the law of causality, which is, therefore, by Hamilton's own method, shown not to be necessary. This method must, therefore, be characterized as "impotent," since it fails to account for the necessity of the law of causality, as we are at liberty to choose between the two inconceivable alternatives. The universal rejection by mankind of one of these inconceivable alternatives, and the acceptance of the other, proves that the ground of the rejection is not its inconceivability.

9) *The impossibility of an absolute commencement is known by rational intuition, and hence the necessity of its contradictory—that every event must have a cause.* It is true that we can not conceive the eternal. The imagination is not competent to deal with the infinite. Intuition only has this power. Though the imagination can not grasp the eternal, it is yet able to see that there is no past date, however remote, before which there might not have been being. The imagination can not, therefore, deny the eternal, and there is no other faculty which can. On the other hand, intuition has positive power to know that an absolute commencement is impossible. *For, before a thing is, it can not act, and can not, therefore, bring itself into existence; if it does act, it already is, and hence does not bring itself into existence.*

The propositions, *There is an absolute commencement*, and *Every event must have a cause*, are virtually contradictories, as has before been shown; but the falsity of either of two contradictories, is logically identical with the truth of the other; hence, the impossibility of an absolute commencement, that is, that an event can take place without a cause, is the necessity that every event must have a cause.

In establishing the law of causality, we do not employ the law of conflictives, or, as it is commonly called, the

law of contradiction; for, under this law, though we can pass from the affirmation of either of two conflictives to the denial of the other, yet we can not pass from the denial of either, to the affirmation of the other; but this we can do under the law of contradictories, commonly called the law of excluded middle. Thus, under the law of conflictives, if we know that a body is spherical, we know that it is not cubical; but if we simply know that it is not spherical, we do not know that it is cubical, since it may be cylindrical or conical, or it may have any one of the multitude of possible forms. But in the case of contradictories, the propositions are not only conflictive, so that the truth of either involves the falsity of the other, but they are universally inclusive, no other case being possible, so that the falsity of either involves the truth of the other.

The intuition of the impossibility of an absolute commencement is, therefore, virtually, the intuition of the necessity of its contradictory—that every event must have a cause. We do not reach the judgment of causality through the *impotency* of the mind to conceive an absolute commencement, but through the *potency* of the intuitive faculty to apprehend that an absolute commencement is impossible.

It is to be remarked that the *inconceivability* of an absolute commencement, as spoken of by Hamilton, is to be understood in the sense that we can not understand how it can be, and not in the sense that it can not be imagined; for the mind can, by an act of the imagination, form the picture of an object, springing, without cause, from non-entity into being. Though the picture of an absolute commencement can be formed, yet it is true, not only that the mind is unable to understand how an absolute commencement can be, but that it has positive power to know that such commence-

ment can not be at all, since it clearly apprehends that it is absolutely impossible for nonentity to spring into being. On the other hand, eternal existence is inconceivable in the sense that it can not be imagined, and not in the sense that it is known to be impossible. Though it were true that eternal existence is inconceivable by us in the sense that we can not understand how it can be, yet its necessity is apprehended by reason as the condition of the facts of the universe, otherwise nonentity must have sprung, without cause, into entity, which is impossible.

The above demonstration shows the falsity of the theory of Hume, that the relation of cause and effect is resolvable into that of antecedent and consequent. It is true that we perceive succession, not cause. But a *mere* antecedent of an event is simply that which accidentally goes before the event. Hence, the absence of a mere antecedent would not be followed by the disappearance of the event; for the antecedent, whose disappearance is followed by the disappearance of the event, is more than a mere antecedent—it is a condition.

Hume held, it is true, that a cause is an immediate and invariable antecedent. Then it is more than a mere antecedent, since it is that without which the event would not take place; for, if the event could take place without it, then it is not necessarily an invariable antecedent. But that without which the event could not take place is a condition of the event. The conditions of an event are, therefore, all those antecedents, whether dynamical or non-dynamical, without which the event would not take place.

A non-dynamical condition, though a necessary antecedent, is not efficient in bringing about the event, since then it is not non-dynamical. Thus, space is a non-dynamical condition of motion. The absence of support

is a non-dynamical condition of the fall of a body. In general, space, time, and the absence of preventing influences are the non-dynamical conditions of the occurrence of any event. This is intuitively certain; for without space and time, there could be no event, or, if there be preventing influences, the event will, of course, be prevented, and consequently will not occur.

A dynamical condition is that which is efficient in producing the event. Thus, force is a dynamical condition of the change of the condition of a body with respect to rest or motion. The sum of the dynamical conditions of an event is the cause of the event.

If Hume's theory be true, that a cause is nothing more than an immediate and invariable antecedent, then, though it is a condition, that without which the event would not occur, it is merely a non-dynamical condition, totally devoid of efficiency. It has no influence in producing the event, for then it would not be non-dynamical. Hence, the event must bring itself into existence; that is, nonentity springs into entity, which is absurd. Hence, an event is impossible without dynamical conditions as well as non-dynamical; but the sum of the dynamical conditions is the cause. Hence, every event must have a cause.

The remaining laws may be more briefly treated.

The second law is, *The effect is always complex.* Thus, a blow of the hammer drives the nail, agitates the air, produces sound, develops heat, etc.

Sometimes the elements of a complex effect are simultaneous, and sometimes successive.

The third law is, *The cause is always complex.* This is true of the cause proper, or the sum of the dynamical conditions. For a stronger reason is it true of the sum of all the conditions, dynamical and non-dynamical.

Thus, the path of a projectile is due to the intensity

and direction of the projecting force, the action of gravity, and the resistance of the air. In addition to these dynamical conditions, we have the non-dynamical conditions, space, time, and the absence from its path of solid obstacles, such as trees, buildings, etc.

The fourth law* is, *The complexity of the cause is proportionate to the complexity of the effect.* Let us consider any effect and its cause, both of which we have found to be complex. Now, any modification of the effect requires a modification of the cause, since the modification of the effect is an event which must have a cause. A new element in the effect, therefore, requires a new element in the cause.

The fifth law is, *Like causes and conditions are followed by like effects.* For whatever exists in the causes and conditions to determine the effect in one case, exists to determine it in the other case, since, by hypothesis, the causes and conditions are essentially the same.

It is, however, to be observed that two effects, alike in one aspect, may follow diverse causes. Thus two men may be killed, one by a pistol ball, the other by poison. As regards death, the effects are alike; but the immediate effects on the body are as diverse as the causes themselves.

3d. *Law of events.* The *law* of an event is the mode of its occurrence. An event must occur in some manner, if it occur at all, and the manner of its occurrence is its law; hence, every event must have its law. That every event must have its law is affirmed, *a priori*, by intuition; what that law is can be discovered only *a posteriori*, by investigation.

The nature of the cause and other conditions of an event determines the character of its law, and a knowl-

* For the fourth law, the author is indebted to Prof. Tappan of Kenyon College.

edge of these may enable us to predict the character of the law; but the law should never be regarded as certain till verified by experience. A knowledge of law enables us to predict what events will take place, or what phenomena will appear, as the effects of given causes under given conditions. Effects become, in turn, the conditions and causes of other effects. Thus, phenomena, as appearances, affect the conscious subject, and are the conditions of other phenomena. A thought may awaken desire, and a desire may induce volition. The events of the material world are related according to law.

Effects are known by experience, but a knowledge of conditions and laws often enable us to predict consequences. In this power of prevision lies one of the chief advantages of science.

The *absolute* is that which is free from the relation of dependence on any power without itself. It is the *unconditioned.* It is not the *unrelated*—that which exists out of all relation; but it is the *independent*—that which is free from the one relation of dependence. Though existing out of the relation of dependence upon any thing else, the absolute is not incapable of existing in other relations to other things.

Nature appears as an indefinite chain, each link of which is both an effect and a cause, or, if not a cause, at least an instrument, both conditioned and a condition. Whence, then, is nature? Three suppositions are possible—the chain of causes and effects, as to the number of links, is infinite, or finite without an absolute head, or finite with an absolute head.

If the chain is infinite, each link, as an effect, is conditioned, and affords no resting place for thought, since the conditioned implies the condition. Tracing the series back from the conditioned to its condition, which is also conditioned, we find, under this supposition, nothing

which is not conditioned, or no absolute condition. Though every thing seems to be accounted for, by referring it to its condition, yet the condition of each conditioned link is itself conditioned, and nothing is absolutely accounted for, since every explanation requires further explanation as we go back along the series indefinitely. This series has no head, absolute or conditioned, since by supposition it is infinite.

If the chain is finite without an absolute head, the first link, not being absolute, is dependent, or conditioned, and conditioned without a condition, which is impossible.

Since the first supposition is unsatisfactory and the second involves an impossibility, the rational mind will adopt the third, or only remaining supposition — that the chain is finite, as to the number of links, and has an absolute head.

From the facts of the universe, it may be inferred that the Absolute is a Divine Personality, eternal and supernatural, endowed with intellect, sensibility, and will, involving in himself as Creator, liberty, spontaneity, and autonomy, and possessing power, wisdom, and goodness, in infinite perfection.

*Final cause*, or purpose, follows, as a corollary, from the doctrine of the Absolute as the intelligent cause of the universe.

## CHAPTER VI.

### INTUITIONS CONTINUED.

**The Ego** is the subject of psychical phenomena—it is that which cogitates, and feels, and wills.

Psychical phenomena are known by consciousness; but the conditional necessity of the ego is known by rational intuition. These phenomena imply a subject, and consciousness of them implies a conscious subject. The subject of the phenomena is identical with the subject of the consciousness, since it is not possible for a subject to be conscious of the phenomena of any other subject than itself.

As events beginning in time, psychical phenomena must have causes. The cause of the phenomena may be the conscious subject, endowed with the faculties of intellect, sensibility, and will, or some external object acting upon the ego as susceptible of given affections, or the ego acting in conjunction with some external object. In the first case, the ego is chiefly active; in the second, chiefly passive; in the third, both active and passive.

A *faculty* of the ego—its power of acting in a given manner, or its susceptibility of being in a given state—is implied by every act or state. Phenomena essentially alike are referred to the same faculty, but phenomena essentially unlike, are referred to different faculties.

**Theories relating to the ego.**—They are the following:

*Hume's theory.* "For my part, when I enter most intimately into what I call myself, I always stumble on

some particular perception or other,—of heat or cold, light or shade, love or hatred, pain or pleasure. I never catch myself, at any time, without a perception, and never can observe any thing but the perception."

If *psychical phenomenon*, which is more general, be substituted for *perception*, which is too narrow, the above statement would be, not only clear, but correct.

Hume also says, "If any one, upon serious and unprejudiced reflection, thinks he has a different notion of himself, I must confess I can no longer reason with him."

This is well enough so far as it implies that the immediate objects of consciousness are psychical phenomena, but not the soul itself; yet it is incorrect, if it implies that there is nothing but the phenomena.

But Hume farther says, "He may, perhaps, perceive something simple and continued, which he calls himself, though I am certain that there is no such principle in me." *Human Nature*, Part IV., Sec. 2.

Hume might have said, correctly enough, I am certain that I am not conscious of any such principle in me; but he was not warranted in saying, "I am certain that there is no such principle in me." There might have been such a principle in him, though he was not conscious of the fact; for the ego does not know itself by consciousness, but apprehends the conditional necessity of itself by rational intuition. Thus, if there is thought, there is something which thinks.

What did Hume mean by "I" and "me"? With all his positiveness, it is hardly to be supposed that Hume really identified himself, whom he calls "I," with what he calls "perception." Does the perception stumble on the perception? The "I" which stumbles on the perception, is to be discriminated from the perception on which it stumbles. Without the "I" as the subject of perception, the perception itself would be impossible.

*Reid's theory.* "I am conscious of perception, but not of the object I perceive; I am conscious of memory, but not of the object I remember. . . . . Our sensations and thoughts do also suggest the notion of a mind and the belief of its existence, and of its relation to our thoughts." *Inquiry*, Chapt. II., Sec. 7. This is correct, as far as it goes, but the word "suggest" is hardly strong enough.

*Stewart's theory.* After considering matter, Stewart says, "The case is precisely similar with respect to mind. We are not immediately conscious of its existence; but we are conscious of sensation, thought, and volition — operations which imply the existence of *something* which feels, thinks, and wills." *Stewart's Philosophy*, page 2. This is correct and well expressed.

*Hamilton's theory.* "Our knowledge is either of matter or of mind. Now, what is matter? What do we know of matter? Matter, or body is to us the name, either of something known, or of something unknown. In so far as matter is a name for something known, it means that which appears to us under the forms of extension, solidity, divisibility, figure, motion, roughness, smoothness, color, heat, cold, etc.; in short, it is a common name for a certain series, or aggregate, or complement, of appearances, or phenomena, manifest in co-existence. But as the phenomena appear only in conjunction, we are compelled, by the constitution of our nature, to think them conjoined in and by something; and as they are phenomena, we can not think them the phenomena of nothing, but must regard them as the properties or qualities of something that is extended, solid, figured, etc.

"Now, that which manifests its qualities — in other words, that in which the appearing causes inhere, that to which they belong, is called their *subject*, or *substance*, or *substratum*. To this subject of the phenomena of

extension, solidity, etc., the term *matter* or *material substance* is commonly given; and therefore, as contradistinguished from these qualities, it is the name of something unknown and inconceivable.

"The same is true in regard to mind. In so far as mind is the common name for the states of knowing, willing, feeling, desiring, etc., of which I am conscious, it is only the name for a certain series of connected phenomena or qualities, and consequently expresses only what is known. But in so far as it denotes that subject or substratum in which the phenomena of knowing, willing, etc., inhere, — something behind or under these phenomena, — it expresses, what in itself, or in its absolute existence, is unknown.

"Thus, mind and matter, as known or knowable, are only two different series of phenomena or qualities; mind and matter as unknown and unknowable, are the two substances in which these two different series of phenomena or qualities are supposed to inhere. The existence of an unknown substance is only an inference we are compelled to make, from the existence of known phenomena; and the distinction of two substances is only inferred from the seeming incompatibility of the two series of phenomena to cohere in one." *Bowen's Hamilton*, page 89.

This passage is worthy of study. If it contains error, it is in holding the substance of both matter and mind to be unknown and unknowable. It is true that we perceive the phenomena of matter and not its substance; and that we are conscious of the phenomena of mind, and not of its substance, or of the soul itself. But if we are compelled to infer the existence and the distinction of two substances, called matter and mind, as Hamilton declares, matter and mind are not altogether unknown and unknowable, unless, forsooth, we are com-

pelled by the constitution of our minds and by the force of evidence to make illogical inferences.

A thing is not to be declared unknown and unknowable, because it is not known in a certain way, as, for example, by perception or consciousness; for inference and intuition are also modes of knowledge. By inference we are not to understand a mere guess, but a logical deduction, such as a corollary in Geometry. It must, however, be admitted that the substance of neither matter nor mind is an object of intuition; but the necessity of substance, whether matter or mind, is such an object. But if the necessity of mind, as the substance or substratum of psychical phenomena, is known, the actuality of mind, as a substance, is also known, as involved in its necessity; hence, the substance of mind is not absolutely unknown and unknowable.

Hamilton further says, "I, at present, avoid entering into the metaphysics of substance and phenomena. I shall only observe, in general, that philosophers have frequently fallen into one or the other of three different errors. Some have denied the reality of any unknown ground of the known phenomena, and have maintained that mind and matter have no substantial existence, but are merely the two complements of two series of associated qualities. This doctrine is, however, altogether futile. It belies the veracity of our primary beliefs; it leaves unsatisfied the strongest necessities of our intellectual nature; it admits, as a fact, that the phenomena are connected, but allows no cause explanatory of the fact of their connection.

"Others, again, have fallen into an opposite error. They have attempted to speculate concerning the nature of the unknown grounds of the phenomena of mind and matter, apart from the phenomena, and have, accordingly, transcended the legitimate sphere of philosophy.

"A third party have taken some one or more of the phenomena themselves, as the basis or substratum of the others. Thus, Descartes, at least as understood and followed by Malebranche and others of his disciples, made thought or consciousness convertible with the substance of mind; and Bishops Brown and Law, with Dr. Watts, constituted solidity and extension the substance of body. This theory is, however, liable to all the objections which may be alleged against the first. . . . .

"Mind can be defined only *a posteriori*, — that is, only from its manifestations. . . . . What we mean by mind is simply that which perceives, feels, wills, desires, etc." Pages 100 and 101. This accords with the view of Aristotle, who defines the soul to be "the principle by which we live, and move, and perceive, and understand." It also agrees with that of St. Augustine, who says, "Mens se cognoscit cognoscendo se vivere, se meminisse, se intelligere, se velle, cogitare, scire, judicare."

*John Stuart Mill's theory.* "My mind is but a series of feelings, a thread of consciousness, with the background of the possibilities of feelings." *Exam. of Hamilton*, Chapter XII.

Mill is too much inclined to identify the mind with its phenomena. Possibly he had a glimpse of the truth in what he called "the background of the possibilities of feelings." The "background" is the soul; the "feelings" and, as should be added, the cognitions and the volitions are its phenomena.

*Bain's theory.* "The operations and appearances that constitute mind are indicated by such terms as feeling, thought, memory, reason, conscience, imagination, will, passions, affections, taste. But the definition of mind aspires to comprehend, in few words, by some generalization, the whole kindred of mental facts, and to exclude every thing of a foreign character." *Sen. and Int.* Ch. II.

In speaking of "the operations and appearances that constitute mind." Bain identifies mind with its phenomena. If "the mind is the sum total of subject experiences," as Bain elsewhere declares, then we are conscious of mind, since we are conscious of these phenomena; but the recognition of a phenomenon on its recurrence, implies a spiritual subject enduring through the period from the occurrence of the phenomenon to its recurrence, and therefore distinct from the fleeting phenomena. The discrimination of one psychical phenomenon from another, can be explained only by referring them to a common subject, which, being affected differently by them, discriminates the one from the other. One phenomenon can not discriminate itself from another; for that would imply that an act or an appearance is an intelligent being, which is not the case.

*Dr. Porter's theory.* "Of the ego itself we are directly conscious." *Porter's Elements*, Part I., Chap. I.

This statement is not to be admitted on authority, and is not verified when consciousness itself is interrogated. Consciousness is immediate and, therefore, certain knowledge. If the ego is conscious of itself, any sound mind, to say nothing of such philosophers as Hume, Reid, Stewart, and Hamilton, could be no more mistaken with regard to the fact, than it could be with regard to the consciousness of cognitions, feelings, and volitions.

There is a sense, however, in which we may admit the truth of Dr. Porter's statement. Taking *consciousness* in its *literal* sense, as knowing something along with knowing something else, we grant that the ego is conscious of itself; for it knows itself along with knowing any thing else—it can not know any thing else without knowing itself; neither can it know itself without knowing something else. But *how* does the ego know itself? In knowing any thing else, it apprehends,

by rational intuition, the conditional necessity, and hence the reality of itself as the subject of that knowledge. But to be conscious of any thing, in the ordinary acceptation of the word *conscious*, is immediately to experience that thing. No one holds that the mind in a quiescent state is an object of consciousness; for consciousness itself is inconsistent with quiescence. Hence, the mind can not be conscious without some other object of consciousness than the mind itself, or the consciousness itself, or the mind as conscious; in other words, consciousness is impossible without some other object than the quiescent mind itself, or the consciousness itself, or the conscious mind itself. But when the ego is conscious of any act, it knows itself through the rational intuition of its conditional necessity, as the subject both of the act and of the consciousness of the act.

How Dr. Porter was led to his view will, perhaps, be seen from the following quotation: "A psychical act or state is, as we have seen, in its nature complex, consisting of three elements in intimate relation to each other —the ego, the object, the acting or suffering of the passing moment. But the act or suffering is inconceivable, except as belonging to the ego and occasioned by the object. Of this double relation, consciousness must take notice. It must, therefore, also take notice of the terms or elements to which it is related."

The central thought here is, "The act or suffering is inconceivable, except as belonging to an ego and occasioned by an object." Dropping the last expression, "and occasioned by an object," as not now under consideration, we have left, "the act or suffering is inconceivable, except as belonging to an ego." But the inconceivability of "the act or suffering, except as belonging to an ego," is not a consciousness of the ego, and does not establish Dr. Porter's doctrine that the ego is

conscious of itself. It simply shows that psychical phenomena are inexplicable without a subject.

There is, however, more than an inconceivability of the act or suffering, except as belonging to an ego — there is a positive intuition of the necessity of the ego, on the condition that the act or suffering is experienced in consciousness, otherwise these phenomena, having no subject, would be the phenomena of nothing, which is impossible. Consciousness, of course, takes notice of this intuition. Should it be said that if consciousness takes notice of the intuition of the relation of the act and suffering to the ego, as their subject, "it must, therefore, also take notice of the terms or elements to which it is related," the answer is, not unless these terms are present phenomena, as consciousness of memory does not take notice of the past reality remembered, since we are not conscious of the past. But the intuition itself directly apprehends, not the ego, but the necessity of the ego. If, therefore, consciousness, in taking notice of this intuition, should take notice of the terms of this intuition, it would take notice of the necessity of the ego, and not of the ego itself. But the truth is, the ego is conscious, not even of the necessity of itself, but of the intuition of the necessity of itself, and in general, of psychical phenomena. By rational intuition, the ego apprehends that these phenomena must have a subject, and identifies that subject with itself, since it could not be conscious of the phenomena of any other subject. The question at issue is not whether the ego knows the fact of its own existence, that is admitted, but how this knowledge is attained? Dr. Porter says, immediately by consciousness. We say by rational intuition — not the intuition of the ego itself, but of its necessity.

Dr. Porter further says, "It is of the very nature and essence of a psychical state to be the act or experience

of an individual ego. We are not first conscious of the state or operation, and then forced to look around for a something to which it is to be referred, or to which it may belong." This is true, and accords with the fact that the conditional necessity of the ego is, at once, apprehended by rational intuition, and that to the ego, as subject, psychical phenomena are directly referred. We are conscious, not of phenomena in the abstract, but of determinate phenomena, — not of phenomena without a subject, but of the phenomena of the ego, the same ego which is conscious of them, since it is impossible for an ego to be conscious of the phenomena of any other ego than itself.

Again, Dr. Porter says, "A mental state which is not produced or felt by an individual self, is as inconceivable as a triangle without three angles, or a square without four sides." But that does not prove that the soul is conscious of itself, but that psychical phenomena are inexplicable without a subject; and not only inexplicable, but impossible without a subject; but this is knowing that the soul is, through the rational intuition of its necessity, and not by consciousness. Neither conceivability nor inconceivability is a test of truth. We may conceive, or picture by the imagination, an event without a cause; but intuition declares that an event without a cause is an impossibility. We can not conceive, or picture by the imagination, infinite space, yet intuition affirms that infinite space is a reality.

Dr. Porter says again, "This relation of the act to the self is not inferred, but is directly known. The fact of memory proves this beyond dispute. In every act of memory, we know or believe that the object now recalled was formerly before the mind; in other words, I, the person remembering, did previously know or experience that which I recall. But how could this be possible if

the first act or state was not known, when it occurred, to belong to the same ego which now recalls it?" It was known to belong to the ego, that point is not the one in dispute; but how was it known to belong to the ego? The necessity of the ego, as the subject of the original phenomena, was known by intuition; the necessity of the ego is, in like manner, known as the subject of the memory; but the subject of the memory must be the same as the subject of the phenomenon remembered, otherwise the memory itself would be impossible.

The ego itself is not the object of consciousness, nor even of rational intuition; but the conditional necessity of the ego is an object of direct intuition. Knowledge of the necessity of the ego involves a knowledge of its actuality, and of this knowledge there is consciousness; but consciousness of this knowledge should not be mistaken, as it often is, for a consciousness of the ego; if the ego itself were, in its essence, an object of consciousness, then indeed might we solve the mysteries of the spirit. The ego is not the object, but the subject of consciousness, and if the subject, then a reality. The ego is not known by consciousness as an act or state; for that would identify the ego with a phenomenon. Neither is the ego in a definite act or state known as the object of consciousness, but it is the act or state itself that is the object. This act or state is known by rational intuition to be impossible, unless it has the ego for its subject; but the intuition that an act or state, without the ego as its subject, is impossible, is the intuition of the necessity of the ego, on the condition that there is consciousness of the act or state. Whenever the ego, by consciousness, experiences a psychical phenomenon, it apprehends, by the act of rational intuition, the necessity of itself, as the condition or ground of the phenomenon. The subject and the object, though distinguishable, are

not separable in cognition — one can not be known without the other; but the object is known empirically, while the subject is known rationally.

**Personal Identity** is the continued essential sameness of the ego. Every sane person has an irresistible conviction of his personal identity, as is clearly shown by the universal anticipation of the future consequences of past acts.

The necessity of personal identity is known by rational intuition as the condition of the phenomena of memory; for, if personal identity be not a fact, memory would be impossible, since the person, not being the same, could not remember the past experience of another person as his own. As it is not strictly the ego itself, which is apprehended by rational intuition, but the conditional necessity of the ego, as the subject of psychical phenomena, so it is not strictly personal identity itself, which is apprehended by rational intuition, but the conditional necessity of personal identity, as the condition of the fact of memory, since intuition at once knows that, unless personal identity be a fact, memory itself would be impossible.

Personal identity does not inhere in the cognitions, feelings, and volitions themselves, which are successive and continually changing, but in the ego which cogitates and feels and wills. The ego maintains its identity, while its phenomena change continually. The fact of personal identity is absolutely incompatible with the doctrine of Mr. Bain and others, that "the ego is the sum-total of subject experiences;" for, in the ever shifting phenomena of which we are conscious, the universal belief of mankind in personal identity can find no possible foundation.

Neither does consciousness constitute personal identity, as Locke seems to teach. He says, "Since consciousness

always accompanies thinking, and it is that which makes every one to be what he calls *self*, and thereby distinguishes himself from all other thinking beings, in this alone consists personal identity, *i. e.*, the sameness of a rational being; and as far as this consciousness can be extended backward to any past action or thought, so far reaches the identity of that person; it is the same self now it was then; and it is by the same self with this present one that now reflects on it, that that action was done." *Essay*, Book II.. Chapter XXVII., Section 9.

Locke here confounds the evidence of personal identity with personal identity itself. Consciousness reveals psychical phenomena, and this revelation is the condition on which rational intuition apprehends the necessity of the ego; consciousness likewise reveals the memory of past phenomena, and this revelation is the condition on which rational intuition apprehends the sameness of the ego, that is, personal identity. Locke is incorrect in saying that "consciousness can be extended backwards to any past action or thought," for consciousness is limited to present phenomena. We remember past phenomena, and are conscious of the memory, but not of the phenomena. The memory, much less the consciousness, does not constitute personal identity, but is the evidence of that identity.

Memory, though essential to my present knowledge of my past acts, though proving my connection with those acts, is not essential to that connection; for I might have performed those acts, though I do not now remember them. The identity, though essential to the memory, does not consist in the memory, since it may exist, and yet the memory be wanting. Evidence is essential to a knowledge of a fact, but not to the fact itself, and should not be confounded with the fact.

To illustrate the relation of memory to personal iden-

tity, take a case similar to the one given by Dr. Reid. A boy wins a prize at school; in middle life, he is made a general and wins a battle; in later life, he is made president. The general, we may suppose, remembers winning the prize, and the president remembers winning the battle but not the prize. Since the general remembers winning the prize, he is identical with the boy; and since the president remembers winning the battle, he is identical with the general, and consequently is identical with the boy, since the general is identical with the boy; but if memory constitutes personal identity, as Locke seems to teach, then the president is not identical with the boy, since he does not remember winning the prize. Hence, the president is both identical and not identical with the boy, which is absurd. The identity of the president with the boy is of course consistent with such changes as physical growth and mental development.

The identity of another person is, by that person, known by rational intuition, as my own identity is known by myself; but the identity of that person is believed by me, on evidence more or less conclusive; hence, this belief may vary in degree between the limits certainty and impossibility.

The identity of things in general is known by resemblance, but is consistent with great changes, as in the case of a tree, throughout growth and decay, where there is organic unity; or, as in case of a wagon, which has been frequently repaired.

## CHAPTER VII.

### SENSATION.

**1. Sensation defined and illustrated.** — *Sensation* is the feeling which is occasioned by the excitement of some part of the organism. In general, sensation results from some external stimulus.

Take an apple, for example. Through the senses of smell, taste, touch, hearing, and sight, and the muscular power, we have, respectively, the sensations of odor, flavor, roughness or smoothness, sound, color, and resistance. The sensations are not cognitions of the apple, but are contingent conditions of cognitions.

Sensation is a phenomenon of the *Sensibility*, but from its intimate relation to the Intellect, as the condition of perception, it is necessary to treat it in this connection.

Sensations are known by consciousness, are analyzed, compared, identified, discriminated, and classified by reflection, and are referred, by rational intuition, to the ego as their subject, and to some object as their cause.

**2. Conditions of sensation.** — These are the sensorium, excitants, action of the excitants upon the sensorium, and the sensibility.

1st. The *sensorium* is the nervous system and the organs of the special senses. It is the first condition of sensation.

(1) The *nervous system* is a mass of excitable substance consisting of a central mass called the brain, located in the head; the spinal cord, inclosed in the back-bone; the nerves, a system of ramifying filaments; and the

ganglia, or expansion of the nerves into occasional knots, or subordinate nerve centers. The nervous substance consists of white matter composed of fibers, and gray matter containing fibers and cells intermingled. The fibers are exceedingly minute, and constitute the media of connection and communication. The cells or corpuscles are rounded irregular little bodies, and serve as nerve centers, or junctions, where the fibers have their origin and termini, and multiply their connections. The nerves constitute the medium of communication between the various parts of the organism and brain as principal center, or the ganglia as subordinate centers. One set of nerves, the *afferent*, conduct impressions to the center, and another set, the *efferent*, convey stimuli from the center.

(2) The organs of the special senses are the nostrils, the tongue and palate, the skin, the ears, and the eyes, which are, respectively, the organs of smell, taste, touch, hearing, and sight.

The nervous system and the sense organs, taken collectively, constitute the sensorium, which is, as before stated, the first condition of sensation.

2d. An *excitant* is something which is capable of affecting the sensorium. It is the second condition of sensation. Thus, odorous objects excite the sense of smell; sapid objects, the sense of taste; tangible, the sense of touch; audible, the sense of hearing; and visible, the sense of sight.

Also, special agents, as heat, light, electricity, magnetism, etc., affect the nerves, and afford conditions of sensation. The sensation corresponds to the nerve affected. Thus, the excitement of the optic nerve is followed by the sensation of light; an excitement of the auditory nerve, by the sensation of sound.

A blow, or sudden shock, or injury, may, by exciting

the nerves of any special sense organ, be followed by the sensation usually experienced in that organ. Thus, a flash of light may accompany a severe blow.

Sensations at certain localities may even be induced by a thought directed to those localities, especially if the thought is accompanied with emotion. In this case, the thought serves the purpose of an excitant, and thus a given nervous state is the resultant of an antecedent nervous state and a mental act combined.

Sensations may also be due to the revivals of the residual excitement of the sense organ.

3d. *The action of an excitant upon the sensorium* is the third condition of sensation. Thus, a luminous object reflecting light to the eye is the usual condition of vision; a material object in contact with the hand, or with some other portion of the body, is the condition of the sensation of touch; and so on, for the other senses.

4th. The *sensibility* is the susceptibility of feeling. It is the fourth condition of sensation. The other conditions are chiefly physical; but this is psychical; and sensation is itself not a physiological, but a psychical phenomenon. The excitement of the nerves, though an antecedent condition of sensation, is not sensation itself. Sensation, then, is not the excitement of the sensorium, but the sympathy of the soul with this excitement. The fact that we *feel*, as consciousness attests, is proof of the fact that we have sensibility.

**3. Sensations localized.**—A sensation is *localized* in that part of the sensorium affected. That we have the power to localize sensations is an unquestioned fact, whether that power is original or is acquired by experience. Thus, the toothache is located in the tooth affected, and not in the hand; an injury to the foot is not referred to the head; taste is referred to the tongue and palate. But certain sensations are vaguely localized.

We know by intuition that the sensation is somewhere, and by experience that it is in the sensorium, though the exact place in the sensorium is not always definitely determined. The sensorium, psychologically considered, is the *locus* of sensation.

**4. Object of consciousness in sensation.**—The object of which we are conscious in sensation is not the excitant; it is not the sensorium itself as consisting of the nervous system and the sense organs; it is not the sensorium excited to some form of definite action; it is not the excitement of the sensorium; but it is the *sensation* in the sensorium as the *locus* of sensation. Thus, when I grasp a ball in the hand, I am not conscious of the ball, nor of the hand, nor of the nerves of the hand, nor of the nerves excited, nor of the excitement of the nerves, but of the sensations of touch and resistance located in the hand. I am no more conscious that the sensation is to be referred to the nerves, than that it is to be referred to the muscles or veins. The soul is not conscious that the body has nerves; it ascertains this fact from anatomical investigation; and from physiological reseach, it discovers that the nerves are conditions of sensations, since, when destroyed or paralyzed in a particular part, sensation in that part ceases. But the excitement of the nerves is attended or followed by a sensation, which is the sympathy of the soul with the nervous excitement; and this sensation is the immediate object of which we are conscious.

**5. Quality of sensations.**—The *quality* of sensation involves existence and identity. The *existence* of a sensation is opposed to non-existence; it is reality as opposed to non-reality, or sensation as opposed to non-sensation. But the existence of a sensation does not imply that it must have a previously mentioned, specified characteristic; for it may have some other charac-

teristic. If only the existence of a sensation be given, its character is left wholly indeterminate, and may be, so far as we know, of any kind whatever. The *identity* of a sensation is the fact that the sensation is itself, and nothing else; but the identity of a sensation involves *peculiarity*, or the positive attributes characteristic of itself, and *particularity*, or the negation of the positive characteristics of any other thing.

**6. Quantity of sensations.**—The *quantity* of sensation involves its degree of intensity, and its temporal and spatial relations.

1st. The *degree of intensity* may vary between the limits zero and a degree so great as to be insupportable, resulting in unconsciousness, as is illustrated by pain, and the sensations of light and heat.

2d. The *temporal relations* of a sensation involve the date, or time of its occurrence, and the duration, or time of its continuance. If sensation continues but for a moment, duration vanishes into date.

3d. The *spatial relations* of a sensation involve its locality in the sensorium, and, when more than a point is affected, also its extent, and vaguely, perhaps, its figure, or form, as may be illustrated in case of color and touch. If but a point is affected, extent and figure vanish into locality.

**7. Analysis of sensations.**—The *analysis* of a sensation, is the resolution of the sensation into its elements. A simple sensation, comprising only one element as to peculiarity, is incapable of analysis; but a complex sensation, comprising more than one element, is capable of analysis. A complex sensation can sometimes be analyzed by attentive reflection. Sensations may appear simple to consciousness when in reality they are complex. These may frequently be analyzed by calling to our aid the methods of physical science, as in analyzing

the sensations of color and sound. Reversing the processes of analysis, we may, by a synthetic process, recombine the elements, so as to reproduce a sensation essentially like the original sensation.

**8. Relation, identification, and discrimination of sensations.** — Sensations are similar or dissimilar in *kind*, according as they are acquired through the same sense, or through different senses, and as such may be identified or discriminated.

Sensations are similar or dissimilar in *variety*, according as they involve similar or dissimilar qualities, as to peculiarity, and as such may be identified or discriminated.

Sensations similar in kind may be similar or dissimilar in variety; but sensations dissimilar in kind are also dissimilar in variety.

Sensations similar in kind and variety may agree or differ in degree of intensity, and may accordingly be identified or discriminated.

Sensations similar in kind and variety, and agreeing in degree of intensity, may agree or differ in temporal relations, and may accordingly be identified or discriminated.

Sensations similar in kind and variety, and agreeing in intensity and in temporal relations, may agree or differ in spatial relations, and may accordingly be identified or discriminated.

**9. Classification of sensations.** — Sensations are classified as to kind when referred to the senses or organs through which they are acquired. They may be subdivided, both as to quality and quantity. Sensations are general or special.

1st. The *general sensations* comprise all those connected with the various portions of the organism, except the five senses. They are the following:

(1) The sensations connected with the *muscular system* comprise all those arising from any posture or movement of the body, involving the contraction or relaxation of the muscles, as in standing, walking, lifting, pulling, pushing, striking, etc.

(2) The sensations connected with the *nervous system* comprise those arising from the state of the nervous system—its general condition, not from a special excitement. The nerves, are, however, concerned in all sensation.

(3) The sensations connected with the *nutritive* and *circulatory* systems are such as result from hunger or thirst, or their opposites, and those resulting from an unhealthy state of the organs of digestion.

(4) The sensations connected with the *respiratory system* are such as the exhilaration resulting from copious respiration in pure air, and the feeling of suffocation resulting from bad air or from a lack of air.

(5) The sensations resulting from the *general condition of the body* are such as result from the vigor or elasticity of health, from the weakness of disease, from rest, from fatigue, from the degree of temperature, etc.

2d. The *special sensations* are those which are acquired through the special senses—smell, taste, touch, hearing, and sight. These senses are the principal means for acquiring a knowledge of external objects.

(1) The sensations of *smell* are known by consciousness as located in the nostrils. They may be divided, as to quality, into agreeable and disagreeable, each of which may be subdivided, both with respect to quality and quantity, into an almost endless number of varieties. It is, perhaps, true that no two roses, even from the same bush, have precisely the same odor, and that no two things smell exactly alike. Since it is impossible to apply names to all these varieties, so countless

in numbers, it is customary to designate them, either by the effects which they cause in us, or by the objects from which they proceed. Thus, we speak of agreeable or offensive odors, of the odor of the rose, etc.

(2) The sensations of *taste* are known by consciousness as located in the tongue, the palate, and a portion of the pharynx. These sensations, as those of smell, are divided with respect to quality into agreeable and disagreeable, and each of these may be subdivided into numberless varieties. Perhaps no two dishes of food have precisely the same flavor. The wonderful discriminating power of taste is doubtless the reason why this sense, which ministers to a gross appetite, gives name to the power of appreciating the beautiful in Nature, Literature, and Art. As it is impossible to devise names for all the varieties of flavor, they are designated, like those of odor, by their effects or by their causes.

(3) The sensations of *touch* may be experienced at every point on the surface of the body, but especially in the ends of the fingers, the lips, and the tip of the tongue. The nature of these sensations can be learned only from experience. The sense of touch is very important. In fact, certain philosophers regard touch as the fundamental sense, and the other senses as its special modifications.

(4) The sensations of *hearing* are located in the ear. Sounds, when classified, both as to quality and quantity, exhibit a wonderful variety. They vary from low to high, through all the intermediate degrees, and, in like manner, from feeble to loud, from soft to harsh, from smooth to rough, from light to heavy, and from musical to discordant. No two persons speak the same word exactly alike, even though speaking on the same key; for there will be a difference either in the qualities of their voices, or in their manner of speaking.

(5) The sensations of *sight* are acquired through the eye, and are classified both with respect to quality and quantity. Light varies from the faintest glimmer to the most dazzling brightness. The primary colors, by their possible degrees of intensity, and by their combinations with one another, afford shades of color wonderful in beauty, and countless in variety.

Light is supposed to be due to the vibrations of a subtle medium called ether. According to Tyndall, "The color of light is determined solely by its wave-length. The ether-waves gradually diminish in length from red to violet. The length of a wave of red light is about $\frac{1}{39000}$ of an inch; that of the wave of violet light is about $\frac{1}{57500}$ of an inch. The waves which produce the other colors of the spectrum lie between these extremes."

The velocity of light is 192,000 miles per second, which, reduced to inches, and multiplied, respectively, by 39,000 and 57,500, will give 474,439,680,000,000, and 699,494,400,000,000, the number of vibrations, per second, respectively, of red and violet light.

White light is produced by a combination of all the colors in due proportion. It may also be produced by certain combinations of two colors. Any two colors which, when mixed, will produce white, are called complementary. The different white lights thus produced cause sensations which are indistinguishable, though the lights themselves are physically distinguishable by their different reactions. Green is produced by combining blue and yellow; and violet, by the blending of red and blue.

## CHAPTER VIII.

### PERCEPTION.

**1. Perception defined as an act and as a faculty.**

1st. As an *act*, perception is that process of the intellect by which it gains a knowledge of external objects. It is sometimes called *sense-perception*, to distinguish it from other processes frequently called perception, as when one says, "My perception of this truth is clear." We shall, however, for the sake of brevity, employ the term perception in the technical sense of that of sense-perception.

2d. As a *faculty*, perception is the power to perceive external objects by means of the senses. Thus, we say, "Man is endowed with the power of perception."

**2. Conditions of perception.**—The *conditions* of perception are an object to be perceived, a subject capable of perceiving, and such a relation of object and subject as to cause a sensation.

**3. Elements of perception.**—The *elements* involved in the act of perception are the sensational, the intuitional, the inferential, and the ideational.

1st. The *sensational element* is the sensation accompanying an excitement of the nerves, caused by the action of an excitant upon the organism. This sensation is experienced in consciousness, and is analyzed, compared, identified or discriminated, and classified by reflection. Abstraction and voluntary attention are involved in reflection as the first steps. Sensation, though involved in the complex process of perception, is rather

the antecedent or condition of perception than perception itself. As the beginning of perception it may be regarded as an element of the process. In fact, sensation, original or revived, mingles more or less with the other elements of perception.

2d. The *intuitional element* is subjective or objective. The subjective intuitional element is the apprehension, by rational intuition, of the conditional necessity of the *ego*, with the faculties implied, as the subject of the perception. This element being always present does not attract especial attention. The objective intuitional element is the apprehension, by rational intuition, of the conditioned necessity of a cause of the sensation of which we are conscious. Intuition, though apprehending the conditional necessity of the cause of the sensation, does not apprehend the cause itself.

3d. The *inferential element* is the judgment based on experience, or on investigation, or on information in any way acquired, by which we infer what the cause of the sensation is in reality. It is the conclusion which the intellect reaches concerning the object which causes the sensation.

4th. The *ideational element* is the construction by an act of the imagination, of the appearance of the object which causes the sensation. Thus, we look upon an object, and see it with our eyes open. We then close our eyes, and represent the same object. In the first case, we construct the appearance under the stimulus of sensation; but in the second case, we construct the appearance, by the aid of the memory, in the absence of sensation. If we can picture the object in the absence of sensation, we certainly ought to be able to do it under the stimulus of sensation. The appearance is constructed in much the same way in the two cases, though the object, when presented to the sense, giving definite

sensations, followed by definite inferences, compels definite constructions. These constructions are more vivid and rich in elements than the appearances constructed in the absence of sensation. The construction of the pictures, by the imagination, in the absence of the sensation, is mainly an intellectual act. There may be residual sensations, as when spots are seen after pressing the eye; or revived sensations, as the images which Newton could recall, by act of the will, after looking at the sun. But, more frequently, the image formed in the absence of the object or when the sense is closed, is purely the creation of the imagination, without sensation. This is clear in case an object is represented which has not been perceived or thought of for a long time. No residuum of the sensation can be supposed to remain, but the image formed by the imagination is clear and distinct.

A *percept* is the knowledge of a quality of an object gained through a single sense, as the cause of a sensation in that sense. A percept may be *ideated*, that is, developed into an idea, which may be committed to the keeping of the memory, and recalled, as occasion may require.

The combination of all the percepts relating to an object, gained through all the senses, is the appearance of the object, as acquired by the combined use of all the senses; but the combination of our ideas of these various percepts is our idea of the object.

The combination of all the qualities of an object which are known as the objects of all our percepts relating to that object, constitutes the object as known by the act of perception.

The combination of all the qualities of an object which are known as the objects of all our percepts relating to the object, together with all other qualities and pow-

ers in that object, constitute that object as it is in itself.

The perceptions through the general sensations are more or less vague. It is only those through the special sensations that are clear and distinct, and these we shall now proceed to consider.

**4. Order of treatment.** — Any one of the three following orders might be adopted: We might begin with touch, then pass to the consideration of the other senses, regarding them as modifications of the general sense of touch; or we might begin with sight, the highest sense, then descend through hearing, touch, and taste, to the sense of smell; or we might begin with smell, the lowest sense, then ascend, through the successive gradations, to sight, the highest and most perfect sense. We have adopted the latter order as being the most simple and satisfactory.

## CHAPTER IX.

### PERCEPTION THROUGH SMELL AND TASTE.

**1. Perception through smell** involves sensation, intuition, inference, and ideation.

1st. *Sensations of odor*, as known by consciousness, are located in the nostrils. They are analyzed, compared, identified or discriminated, and classified by reflection.

2d. *Rational intuition* apprehends the conditional necessity of the subject and also of the cause.

(1) The *sensation* being given, intuition apprehends the conditional necessity of the *ego* with the *faculties* involved, as the subject of the sensation, and of the corresponding perception. This element is unobtrusive, since the attention of the ego is directed, not to itself, as being present in every phenomenon, but to the sensation and its cause, especially to the sensation.

(2) *Intuition* also apprehends the conditional necessity of the *cause* of the sensation, but not the cause itself. It apprehends that the sensation must have a cause, but it does not apprehend what the cause is, nor decide whether it is within or without the organism.

3d. The *inference* is the judgment derived from experience, investigation, or other sources, inferring the cause of the sensation. This cause is not in the ego; for the ego is passive in sensation, since sensations are experienced, not only without special volition, but in spite of volition. The cause is, therefore, objective to the ego, though it is not necessarily objective to the organism.

From science we learn that the immediate cause of

the sensation of odor is the excitement of the olfactory nerves located in the nose; that the cause of the excitement is some gaseous effluvium coming in contact with the organ of smell; and that this effluvium is exhaled from bodies, thence called odorous, since the sensation follows the presence of such bodies, and ceases on their removal.

The variety in the sensation of odor, in different cases, is accounted for by the difference in the remote cause, though the peculiar nature of the cause is wholly unknown. The reason why a certain effluvium should excite one sensation rather than another can only be conjectured.

Having learned by experience the nature of the sensation excited by the exhalations of a given odorous body, then, whenever that sensation is experienced, we infer the presence of that body. There is a possibility of mistake in this inference, since different objects may excite sensations of odor scarcely distinguishable. Intuition in affirming that the sensation has a cause, does not err; but the judgment which affirms what the cause is in itself, may err.

4th. *Ideation* pictures to the mind the remote cause of the sensation, after the judgment has inferred what that cause is. In constructing the appearance, the body from which the odor proceeds is usually represented as it appears through the other senses, especially through the sense of sight.

5th. The *relative prominence* of sensation, intuition, inference, and ideation, is a matter of interest. In smell, the sensation predominates, and mainly absorbs the attention. The intuition of the conditional necessity of the subject and object is unobtrusive, though perhaps less so in case of the object than of the subject. The inference relates to the object which causes the sen-

sation, and is more prominent than the intuition, but less prominent than the sensation. The idea of the immediate cause of the excitement of the organ is vague, since the nature of this cause is occult; but the idea of the remote cause from which the exhalation comes, is clear, derived as it is from sight.

6th. The *utility* of the sense of smell is threefold:

(1) It affords pleasure through the sensations of agreeable odors, and thus adds to the enjoyment of life.

(2) It guards us, through the sensations of disagreeable odors, against danger from deleterious exhalations or from unwholesome food.

(3) It may sometimes be used as a chemical test in identifying a substance.

7th. The sense of smell is in close sympathy with the sense of taste, which is in immediate proximity. Savory odors excite the appetite, while offensive smells occasion disgust and disinclination for food.

**2. Perception through taste** involves sensation, intuition, inference, and ideation.

1st. *Sensations of flavor*, as given by consciousness, are located in the tongue and palate, and a portion of the pharynx. They are analyzed, compared, identified or discriminated, and classified by reflection.

2d. *Intuition* apprehends the conditional necessity of the subject with the faculties implied, and of the object as the cause of the sensation.

3d. The *inference* is the judgment inferring the cause of the sensation. This cause is not in the ego, which is passive in sensation, and is, therefore, objective to the ego, but not necessarily objective to the organism.

By experience, we learn that the cause of the sensation of taste is a sapid body brought in contact with the organs of taste, producing in these organs an excitement, which is the immediate cause of the sensation.

From science, we learn the structure and functions of the organs of taste, and that a sapid body, to excite the sensation of taste, must be in a liquid state, or undergo, at least, a partial liquefaction.

What the nature of the cause of the sensation of taste is, in itself, we know not, save that the cause must be adequate to the production of the sensation. There is, perhaps, chemical action between the sapid body and the organ of taste; but why one element should produce one sensation, and another element another sensation, we know not. What the object is, and that it produces the sensation, can be ascertained; but how it produces the sensation, or why that sensation rather than another, is a mystery.

Having learned by experience with what bodies certain sensations are connected, then whenever we identify a sensation which we have learned is caused by an object of a certain class, we infer the object which excites the sensation. There is a possibility of mistake in this inference, since different objects may excite sensations scarcely distinguishable; but the mistake, if it occur, is not in the intuition that there must be a cause, but in the judgment inferring what that cause is.

4th. *Ideation* pictures, not the occult quality which is the real cause of the excitement of the nerves of taste, but the object of which this cause is a quality, as it has been found by experience to appear through the other senses, especially sight and touch, and thus completes the process of perception.

5th. As to the *relative prominence* of these four elements, it is to be observed that sensation, as the chief object of attention, predominates, though not in so marked a degree as in smell. The ego with the faculties involved is implicitly assumed, but is not made the object of special attention. The intuition of the conditional necessity of

the cause is more prominent. The inference is more conspicuous than the intuition, but less conspicuous than the sensation. The image formed by ideation is clear and distinct.

6th. The *utility* of the sense of taste is threefold:

(1) It contributes to our enjoyment through the agreeable sensations which it affords.

(2) It guards against danger through the disagreeable sensations, which deleterious articles of food excite.

(3) It may be used as a chemical test in identifying a given substance.

7th. Taste is intimately associated with touch, as the organs of taste are also organs of touch. In general, we may say, taste gives the sensations of flavor, and touch the sensations of roughness or smoothness; yet in certain cases, these sensations approach and seem to blend. This fact suggests the inquiry whether taste is not a special modification of touch—that is, touch transformed and intensified, and located in proximity to the sense of smell with which it acts in sympathy.

## CHAPTER X.

### PERCEPTION THROUGH TOUCH AND HEARING.

**1. Perception through touch** involves sensation, intuition, inference, and ideation.

1st. *Sensations of touch*, as given by consciousness, are located at the extremity of the nerves terminating in the skin, especially at the tips of the fingers, the lips, and the tongue. They are analyzed, compared, identified or discriminated, and classified by reflection.

2d. *Intuition* apprehends the conditional necessity of the subject with the faculties implied, and of the object as the cause of the sensation.

3d. The *inference* is the judgment inferring the cause of the sensation. This cause not being in the ego, which is passive in sensation, is objective to the ego. When the sensation of touch is experienced, we infer that this sensation is caused by some external body in contact with the organ of touch. As the pressure increases, the tactual sensation runs gradually into the muscular sensation, and the acute perception of touch proper is transferred, by insensible degrees, into the perception of a resisting body, as the cause of the muscular sensation. From Anatomy and Physiology, we learn the structure and functions of the organs of touch in their relations to the muscular and nervous systems.

Through the sense of touch, especially in its relation to the muscular sensation, we obtain unimpeachable evidence of the existence of objects external to ourselves—not external to our spirits only, but to our bodies.

We have already found that we are conscious of sensations localized more or less definitely in the sensorium, which is immediately known as the *locus* of sensation, but not as the nervous system and the sense organs, which constitute, as we learn from science, the material apparatus of sensation. The sensorium, as the *locus* of sensation, is immediately known to be extended, since the sensations, as localized, are known to be reciprocally external. Simultaneous sensations, not reciprocally external, especially if the same in quality, would blend into one, and be indistinguishable. But the fact that such sensations are distinguishable, is proof that they are reciprocally external, and in fact, as such, they are discriminated. Space is at once apprehended by rational intuition as the necessary logical antecedent of the fact that similar simultaneous sensations are discriminated.

If the tips of the fingers of one hand be moved along the other hand, a double sensation is at once excited — the sensation in the fingers touching, and the sensation in the hand touched. The sensations in the two hands are discriminated as situated in loci reciprocally external. As the fingers move along the hand, the motion is detected by the changing localities of the sensations in the hand touched. The loci of these sensations are noticed and constructed into unity, thus giving extension. On pressing the fingers the sensation becomes muscular, a perception of resistance arises, and the hand touched is known, not only as extended, but as resisting. The belief in the correctness of this perception is strengthened and confirmed by grasping one hand with the other. The hand grasped is known to be extended by the loci of the sensations within itself and within the grasping hand; and it has the power of resistance, and is therefore a solid, as is known by its opposing the effort made to close the other hand.

If now the hand of another person be substituted for the hand before grasped, the sensations in the grasping hand will be similar to those before experienced, and their loci will reveal extent, not only in the grasping hand, but in the hand grasped, and the resistance will reveal solidity. These perceptions will be confirmed by those of the other person.

If another object be grasped by the hand, analogous sensations will be experienced in the grasping hand, followed, as before, by the perception of extension, form, and resistance. The hand applied to a great variety of objects will reveal, with respect to each, its size, form, and power of resistance, and will enable us to decide whether a given object is rough or smooth, hard or soft, solid or fluid, sharp or blunt, in motion or at rest.

Having thus found that there are bodies external to our organism, then, when encountering a resistance to our locomotive energy, and not being conscious of causing the resistance ourselves, but being conscious of endeavoring to overcome it, we judge that the power causing the resistance is external to ourselves, and by the application of the hand, learn other qualities of the resisting object.

The sensations of *pain* arising when the body is cut or pierced by sharp tools, or burned by a hot body, are not sensations of touch. Such sensations, by their greater intensity, obscure those of touch, and are followed by perceptions peculiar to themselves.

4th. *Ideation* pictures to the mind the nature of the surface, according to the sensation, as rough or smooth, also the form of the body, and the appearance which it would present to the eye.

5th. As to the *relative prominence* of the four elements connected with the sense of touch, it is to be observed that the sensation, the intuition, the inference, and the

idea are, in average cases, in equilibrium. The tactual sensation is sensibly experienced; the intuition of the necessity of the subject and object is clear; the inference that the sensation is caused by an external object in contact with the organ is decided; and the ideated picture distinctly embodies the inferential judgment, and thus completes the process of perception.

In passing from smell, through taste to touch, we find that, in average cases, the sensation diminishes, the intuition remains constant, the inference becomes more positive, and the idea more clear and distinct.

6th. The *utility* of the sense of touch will be manifest when we reflect that it reveals the external world more positively and certainly than any other sense. The causes of the sensations of smell and taste, though their necessity is apprehended by intuition, are in their nature occult. The cause of the sensation of hearing can not, but by the aid of the other senses, especially of touch, be positively known to be external to the ear itself. We may question whether the object supposed to be seen be not an illusion; but when we touch it, and handle it, and find it extended, figured, solid, and resisting, we no longer doubt its external reality.

7th. The *relation* of touch to the other senses is interesting. It is an opinion, ancient as the time of Democritus, that all the other senses are only modifications of touch. This opinion, though rejected by Aristotle with the assertion that its impossibility is manifest, was revived by Telesius, an Italian philosopher of the sixteenth century, and has been adopted by many philosophers of modern times. All the senses involve touch, or contact of something external with the organs of sense; but smell and taste involve, perhaps, chemical action as well as mechanical contact. The sensations given by the various senses differ so widely, as is evident from a compar-

ison of the sensations of odor, taste, touch, sound, and color, that there is good reason for the popular classification of the five special senses.

**2. Perception through hearing,** as through smell, taste, and touch, involves sensation, intuition, inference, and ideation.

1st. *Sensations of sound*, as given by consciousness, are located in the ear. They are analyzed, compared, identified or discriminated, and classified by reflection.

2d. *Intuition* apprehends the conditional necessity of the subject with the faculties implied, and of the object as the cause of the sensation.

3d. The *inference* is the judgment inferring the cause of the sensation. This cause not being in the ego, which is passive in sensation, is objective to the ego, but not necessarily objective to the organism.

We learn from experiment that a vibrating body communicates vibrations to the air, which are propagated to the ear, causing in this organ an excitement which is the immediate cause of the sensation of which we are conscious. From the sciences of Anatomy and Physiology, we learn the structure and functions of the organ of hearing.

4th. *Ideation* pictures the inference, and represents the cause as it would appear through other senses, especially sight, thus completing the act of perception.

5th. As to the *relative prominence* of the four elements involved in hearing, it is to be observed that the sensation is noticeable, the intuition real, the inference prominent, and the ideation clear and distinct. Let us notice the working of these elements in the process of perception through hearing. We are conscious of a sensation of sound, the attention is abstracted from other things, and directed to the sensation, which is analyzed and classified. Intuition apprehends the conditional necessity

of the subject with the faculties involved. This element is unobtrusive, since the ego is implied by every phenomenon, and does not, therefore, attract special attention. Intuition also apprehends the conditional necessity of the cause, but not what the cause is. Science informs us that the immediate cause of the sensation is the excitement of the auditory nerves, caused by the vibrations of the air, which are, in turn, caused by the vibrations of the sonorous body. The inference is the judgment affirming the cause. The cause is objectified — that is, the sound is judged to be caused by the vibrating body, which is more or less remote, the intermediate causes being but obscurely recognized. The cause is ideated, and we are said to perceive the object. The agitation of the nerves, and the immediate and remote causes of this agitation are the conditions of the sensation; they are the antecedents of the complex process of the perception, rather than elements of that process.

6th. It is not correct to say that we perceive an object through its representative idea, as if we began with the idea as a third thing intervening between the object and the mind; for the idea is the last step in the process of perception. It is the joint product of the action of the objective cause and of the percipient mind, and embodies our inference, or conclusion, concerning the cause of the sensation.

7th. The *utility* of the sense of hearing is evident. Sound not only reveals external objects, but, in certain cases, warns us of danger, and, as employed in language, is expressive of thought, feeling, or volition. To this sense we are largely indebted for the pleasures of social intercourse, and for the enjoyments derived from the arts of music and oratory.

## CHAPTER XI.

### PERCEPTION THROUGH SIGHT.

**Perception through sight,** as through the other senses, involves sensation, intuition, inference, and ideation.

1st. The *sensations of color, light, and shade* are located in the eye. These sensations are given by consciousness, and are analyzed, compared, identified or discriminated, and classified by reflection.

2d. *Intuition* apprehends the conditional necessity of the subject with the faculties implied, and of the object as the cause of the sensation.

3d. The inference is the judgment as to the cause of the sensation. This cause not being in the ego, which is passive in sensation, is objective to the ego.

By experience we learn that light is an essential condition of vision; and, guided by touch, we infer that a material object, more or less distant, from which light comes to the eye, is the remote cause of the sensation, and is the object of perception.

From Optics, as a branch of Physics, we learn the nature and laws of light, and from Anatomy and Physiology, the structure and function of the eye.

Every point in the surface of an object sends out, in all directions, rays of light in straight lines diverging from that point. From a single point in the visible surface of an object, the rays of a diverging pencil in the form of a cone whose vertex is at the point and whose base fills the pupil of the eye, enter the eye through the pupil, and are, by the lenses, brought to a

focus at some point on the net-work of nerves, called the retina, which lines the dark choroid coat of the inner chamber of the eye. The focus of the rays of the converging pencil is the vertex of an interior cone of rays having a common base with the exterior cone.

The *accommodation* of the eye so as to secure distinct vision, at different distances, needs attention. It is a condition of distinct vision that the rays diverging from a point, in a pencil, and entering the pupil of the eye be brought, by the lenses, accurately to a focus on the retina of the eye. Let us suppose a point at such a distance from the eye that the diverging rays from it, which enter the eye are brought exactly to a focus on the retina. Now, if the point be removed a little farther from the eye, the rays from this point, which enter the eye, would be less diverging, and it would seem that they would be brought to a focus before reaching the retina, and crossing at this focus, and diverging back of it, would be spread on the retina in a circle of diffusion having the central ray for its axis. If the point be moved nearer the eye than its first position, it would seem that the interior pencil would reach the retina before the rays are brought to a focus, giving, in this case, also a diffusion circle. A circle of diffusion would actually be formed whenever the point is at a greater or less distance than a certain distance, about eighteen inches in normal cases, were it not for the power of accommodation which the eye possesses. The accommodation is secured by a greater convexity of the anterior surface of the lens as the point is brought nearer the eye, or a less convexity, as the point is removed farther from the eye. This change in convexity is effected by a contraction of the ciliary muscle, when the point is brought nearer the eye, and by a relaxation of this muscle, when the point is removed to a greater distance.

In directing attention from a distant to a near object, or the reverse, we are conscious of a feeling indicating a change going on in the eye — in the first case, of active accommodation; in the second, of relaxation. Both the fact and the necessity of accommodation can be shown by experiment. Fix two pins upright about 3 feet apart, and look at them with one eye nearly in range with the pins, and about 2 feet from the nearest pin. If attention be directed to either pin, the other will appear blurred. Either pin can, at will, be made to appear distinct, but not both at the same time.

We have seen that from a single point in the visible surface of an object, rays of a diverging pencil enter the eye, and are brought to a focus on the retina. Rays of pencils from adjacent points in the surface of the object are brought to foci, on the retina, in adjacent points which are symmetrically arranged with respect to the corresponding points in the object. In like manner, rays of pencils from all the visible points of the object, are brought to their proper foci in corresponding points on the retina, thus forming on the retina an image which is a miniature picture of the object. The cause of the sensation at each point of the image on the retina is, by an act of judgment, objectified and located in its proper position in the surface of the object. If the lenses of the eye bring the rays to foci before reaching the retina, or if they reach the retina before coming to a focus, circles of diffusion will be formed, which by overlapping one another and confusing the image, render the perception of the object indistinct.

Near-sighted persons wear concave glasses to counteract the excessive convexity of the lenses of their eyes. As persons grow old, they gradually lose the power of adjusting their eyes to near objects, especially when small, and are obliged to use convex glasses.

4th. *Ideation* combines and pictures in their true positions the objectified causes of the sensations at all the points of the image on the retina, and thus constructs the objective appearance so as to embody the conclusions of the inferential judgment. The vivid pictures appearing in vision are our ideas of the objects which cause the sensations. These pictures embody our conclusions respecting the objects, and as objectified, coincide with the objects, though they are not the objects themselves, as will clearly appear, while we pursue our investigations.

5th. As to the *relative prominence* of the four elements of vision, it is to be observed that the sensation is unobtrusive, except in case of dazzling light, and brilliant or finely-blended colors; the intuition of the conditional necessity of the ego is implicitly assumed, while that of the cause is explicitly recognized; the inference is clear and definite; and the idea is distinct and vivid.

In passing from smell, through taste, touch, and hearing to sight, in average cases, sensation decreases from its maximum in smell to its minimum in sight; intuition remains constant; inference and ideation increase from their minimum in smell to their maximum in sight. In smell and taste, sensation is greater than intuition, intuition than inference, and inference than ideation; in touch, sensation, intuition, inference, and ideation are in equilibrium; in hearing and sight, sensation is less than intuition, intuition than inference, and inference than ideation.

6th. The *physiological* conditions of sight are the eye, with its coats, the sclerotic, choroid, and retina, its cornea, iris, and crystalline lens, its pupil, chambers, and humors, also the optic nerve and higher centers.

Seeing is not consummated in the eye. The optic nerve conveys the impressions made on the retina to a

cluster of four tubercules, or ganglia, called the *tubercula quadrigemina*, where they are received and transmitted to higher centers. These tubercules, by reflex action, excite the iris, and thus automatically contract or expand the pupil, so as to regulate the amount of light received by the retina. In like manner, by reflex action, the direction of the optic axes are automatically adjusted to an object near or remote.

The tubercula quadrigemina, perhaps reinforced by the *optic thalami*, co-ordinate visual impressions with muscular sensations, and thus preside over those muscular efforts made in maintaining equilibrium or producing motion, in all cases in which sight is essential to perfect action. Let the experiment be made of balancing the body on one foot with the eyes first open then closed.

The visual impressions made upon the retina, received and co-ordinated by the tubercula quadrigemina and optic thalami, are sent up to the *angular gyrus*, a section of the parietal lobe, where they are photographed and still further elaborated, and forwarded to the frontal lobes of the brain, where the judgment as to the cause of the sensation is pronounced, the conclusion ideated, and the process of vision consummated.

The following quotation from Dr. Clark's *Visions*, page 133, places the entire process of seeing, as viewed from a physiological stand-point, in a clear light:

"When light waves from an uplifted dagger fall on the retina, the eye records the facts of color, size, position, motion, etc., and transmits an account of them to the tubercula quadrigemina. This center carefully adjusts the mechanism of the eye, the iris, lenses, muscular apparatus and the like, to the demands of careful observation, co-ordinates the general muscular system for any movement the emergency may require, and makes its visual report to the angular gyrus. The latter center

receives the report, perceives all the details of the dagger, the hand grasping it, the face and action of the owner, whatever constitutes an exact picture of the scene, and transmits a corresponding pictorial report to the frontal lobes. Upon receiving this report — this pictorial representation, — the lobes look at it, ascertain its significance, determine whether the uplifted dagger is raised for inspection merely, or for a threatened or real plunge, or for other purposes, communicate with the instincts and emotions, and decide the will to act."

7th. The *object* primarily revealed in consciousness is not the remote object, or cause of the sensation, nor the waves of light reflected from the object to the eye, nor the image formed on the retina, nor the excitement of the nerves of the retina or of the optic nerve, or of the higher centers, but the sensation of color or of light and shade, obscurely located in the retina, though this sensation is unobtrusive, except in case of strong light or brilliant colors. The phenomena following sensation — the intuition, the inference, and the ideation, are also objects of consciousness.

The object known by rational intuition is neither the sensation, nor the nature of the exciting cause, but *the* conditional necessity of the ego as the subject of the sensation, and the conditional necessity of the object as *the* cause of the sensation.

The objects inferred by the judgment are the visible qualities in the external object which excite sensation.

The idea is the picture, or appearance, embodying our conclusions respecting the object. This idea, though originally formed under the stimulus of sensation, can be retained and recalled in the absence of sensation, in which case it is less vivid but more indeterminate.

8th. To explain how we perceive the true position, magnitude, and form of objects, let it be observed that

the cause of a sensation at a point on the retina at the vertex of an interior pencil, is objectified, ideated, and located at the vertex of the corresponding exterior pencil, the point from which the rays came, and the only point from which they could come, having the direction with which they meet at the focus. The objective point is ideated, and thus seen in its true position.

The perception of the point in its true place may, in part, though this is not probable, be owing to a native insight, analogous to the instinct of a young chick which perceives a crumb in its true place, as is proved by the fact that it picks it up. In man, however, the power to perceive a point in its true place, is, no doubt, chiefly, if not entirely, acquired gradually by experience, guided, in some degree, by the sense of touch, which is tutor to the eye; for, if the point be within reach, its location can be verified by stretching out the hand and touching it, or if a little farther off, by going to it. The location of more distant objects can be only approximately determined by sight; but no correct estimate of the distance of such remote objects as the stars can be made through vision. The determination of these distances requires the nicest measurements and accurate computation.

The causes of the sensations at all the points of the image on the retina are objectified, ideated, and perceived to be located, respectively, at the corresponding points of the object, giving the assemblage of all the visible points in their true positions, and thus the object is seen in its proper place, form, and magnitude.

The movement of a visible point in space is detected by the movement of the image of that point on the retina, though of this movement we seemed to be unconscious, since the attention is chiefly directed to the movement of the objective point. The perception of a variegated surface proves that the sensation at each point of

the image is referred to its special cause in the object. The cause of the sensation at each point of the image being objectified, located, and pictured at the vertex of the corresponding exterior pencil, the point from which the rays came, the assemblage of all these objective, pictured points gives a picture of the object, having not only color, but outline and form; but since the points of this picture coincide with the corresponding points in the surface of the object, it follows that the object itself has extent and form, and this is confirmed by the sense of touch.

9th. Why does the object appear at *full size* when the image on the retina is a *miniature picture?* The axis, or central ray of the pencil, from the objective point through the center of the lens to the image of the point on the retina, is not refracted, and is, therefore, a straight line; that is, the axes of the two corresponding pencils, exterior and interior, form one straight line. The exterior pencil is longer than the interior, and hence the divergence of the exterior pencil, as the rays come from the point to the eye, is less than the convergence of the interior. Now take an object, as a cane, and hold it, in a vertical position, a few yards from the eye. The axes of the pencils of rays from the extreme points of the cane cross at the center of the crystalline lens; and since the exterior pencils are longer than the interior, the points at the extremities of the cane, which are seen in their true position, are farther apart than the images of these points on the retina; hence, the object appears at full size, while its image on the retina is only a miniature picture. Of this image we are unconscious, since the sensation is unobtrusive, and the attention is directed to the objective appearance.

10th. Why is the image *inverted?* and how is the object seen *erect?* Since the axes of the pencils of rays

from any two points cross each other at the center of the lens, and when prolonged in straight lines, form the axes of the corresponding interior pencils, the image of the highest point of the object will be lowest on the retina, and the image of the lowest point of the object will be highest on the retina. The images of the intermediate points of the object are correspondingly arranged on the retina, the image of the higher of two points being lower on the retina; hence, the image is inverted. For like reasons, the sides of the image are reversed; hence the image is symmetrically arranged with respect to the object.

How, then, is the object seen erect, and its sides in their true position? Since the cause of the sensation at the lowest point of the image is seen in its true position at the vertex of the corresponding exterior pencil, and hence at the highest point of the object, where it actually is, and since the cause of the sensation at the highest point of the image is seen where it is, at the lowest point of the object, the object is inverted with respect to the image, and since the image is inverted, the object appears erect.

11th. *Binocular vision*, or double vision through the two eyes, demands attention. Why is it that we see an object single, when an image of it is formed in each eye? If we suppose two appearances for the same object, one for each eye, giving to thought two appearances, then, since each appearance is in coincidence with the object, the supposed two appearances, coinciding with the object, coincide with each other, and form but one appearance, as we find in reality; but this one appearance is the combination of two appearances, as can be proved by their separation on pressing one eye.

The two appearances blend, since for each point of the image on the retina of one eye, there is a corresponding

point of the other image, similarly situated on the retina of the other eye. The sensations at the two corresponding points are referred to the same objective cause in its true position, which is, therefore, seen as one point; and as the same is true for every other point in the visible surface of the object, it is evident that the object ought to appear single, as is really the case.

To render this still clearer, let us consider the appearance, though not the object itself, as the spontaneous creation of the intellect, under the stimulus of the sensation, objectifying the cause of the sensation, assigning to it color, position, extent, and form, not as constituting the object, nor as representing all its qualities, since it has other qualities as revealed by the other senses, but as representing the qualities known in vision. Now, the appearance in vision, considered as an external image, constructed by the imagination under the *stimulus* of sensation, as the product of the effort of the intellect to assign the true cause to the sensation, is in *coincidence* with the object, as is verified by touch.

That the appearance is an objective image, a *construction* or creation of the mind, an idea embodying our inference as to the objective cause of the sensation, *and* not the object itself, is evident from the fact that if we push one eye, moving it gently, we shall see two images clearly separate, one at rest and the other in motion. If the objective appearance is the object, there are two objects, one at rest and the other in motion; but there is only one object under consideration, and that one at rest; hence, the moving image is not the object. Neither is the image at rest the object; for pushing the other eye, this image moves as well as the other; but *the object* is at rest, relatively, at least, as can be ascertained from the testimony of a person touching it with *his* hand; hence, neither image is the object, nor in this

ase in coincidence with the object, since the images are noving while the object is at rest.

The reason why the objective image does not coincide vith the object, when the eye is pressed, is because the nternal image is thus moved to another part of the retna, where an image would be formed by an object in he position of the external image, if the eye were not pressed, and hence the objective image appears in that position. Moving the eye moves the image on the retina the same as if the eye remained at rest, and the object moved as the objective image appears to move; hence, the appearance is constructed, when the eye is pressed, as if the object moved.

If now the pressure be gradually removed from the two eyes, the two objective images will approach and finally coincide with each other and with the object, as can be verified by the hand. The object is not now seen double, though there is an image of it on the retina of each eye; for the objective image, the appearance, seen through one eye coincides with the object, and the appearance seen through the other eye coincides with the object; hence, these two appearances, or objective images, coinciding with the same object, coincide with each other, or appear as one objective image, though they may be regarded as two coincident images.

The creation of the image is, in popular language, called "seeing the object," and this language is best for common use. The spontaneous inference respecting the cause of the sensation, and the ideation of the inference, or the construction, by the imagination, under the stimulus of the sensation, of the appearance embodying the inference, *is seeing the object.* But the appearance seen, when the eyes are open, is no more the object than is the appearance imagined when the eyes are shut. The appearance seen when the eyes are open is held, by the

sensation, to a correspondence with the reality, while the appearance imagined when the eyes are shut, can be changed at will.

Seeing with the two eyes aids in the perception of *relief*, by which a body appears to stand out from a plane, or to have a third dimension, that is, depth, or thickness, in addition to length and breadth. Thus, when a small object, as a marble, is held near the face, the part of the surface seen by either eye, is that hemisphere whose pole is the nearest extremity of the diameter which, when produced, would pass through the pupil of that eye; hence, with the two eyes, more than half of the surface is seen. In seeing, as it were, partially around the object, on opposite sides, the object appears raised, or stands out in space.

A point is not seen in the same direction with the two eyes, though it is seen in the same position. Hold one finger near the face, and look at it towards a wall, first closing one eye, then opening that eye and closing the other. It will be found that the range of the finger on the wall has perceptibly changed. Open both eyes, and look at the wall in the direction of the finger. Two transparent images of the finger appear, through which the wall is seen beyond. In looking at the wall, the optic axes, or lines of vision, are adjusted for the distance of the wall, and not for the distance of the finger, which would require a greater convergence of the axes. Two objective images of the finger appear, since the internal images, with their sensations, have the same positions on the retinas of the two eyes, as they would have if caused by two objects, one for each eye, in the ranges of the respective objective images, and the mind constructs the images according to the usual interpretation of such sensations. The images appear transparent, neither concealing the wall in the range with it and the eye with which it

is seen, since that portion of the wall is seen through the other eye. If one eye be closed, one image will vanish and the other will become opaque. If that eye be opened again, the image which vanished will reappear, and the other will again become transparent. The two images will approach and finally coincide, as the attention is withdrawn from the wall and directed to the finger, and a spot on the wall in the direction of the finger will appear double.

12th. The *material reality* is the remote cause of the sensation. The appearance is the spontaneous creation of the mind, embodying its inference concerning the cause. This ideated inference, however, is not the cause itself. The real objective, or remote cause is more than an image—it is a material reality. But how do we know that there is such a reality? The image which embodies our ideas of the cause of a visual sensation, combines the percepts of color, locality, extent, and form. This combination of percepts, as a mere creation of the mind, located in space, could not, in itself, affect the sense of touch, nor offer any resistance to our muscular energy. It is absurd to suppose that the construction, by the imagination, projected into space, of the combinations of decisions that the cause of certain ocular sensations has a certain color, position, extent, and form, could also excite the sensation of odor, or flavor, or sound, or touch, or oppose our locomotive energy. These new sensations must have causes; and combining our conclusions as to their causes, with our visual image, we have a more perfect knowledge of the cause. The material object which has qualities capable of exciting ocular sensations has also qualities capable of exciting sensations through the other senses. The combination of qualities is the complex manifestation of the forces of a common substance.

In perception, we infer what sort of an object that must be which gives us certain sensations, and the objective image, or ideated appearance, is the mental construction embodying our conclusion. This image corresponds, more or less perfectly, with the object itself. In a geometric sense, the correspondence between the image and its object may be perfect, as it is in normal vision. The objective image in its position, magnitude, and form, is the space conceived to be occupied by the material object, and unless the perception is abnormal, the image and the object are in coincidence. The image represents correctly the geometric properties of the object; but in other respects, we must take the words, *corresponds* and *represents*, with some latitude. Thus, when we see a solid, we do not understand that the objective image is a solid, in the physical sense, but that the object is; that is, that it would offer a resistance if we pressed it with the hand.

In seeing an apple, for instance, we perceive color, size, and form, and construct an image which coincides with the object. We experience a sensation of color, and infer in the apple a power to excite this sensation, and this power is localized, and has assigned to it extent and form; and if our perception be correct, the locality, size, and form of the image, coincide with the locality, size, and form of the apple. But the apple is more than the image constructed by the imagination, as colored, located, extended, and figured; for it can manifest itself through all the other senses; but it is more than the combination of the percepts acquired through all the senses. If the apple is simply a combination of all our percepts concerning it—merely a complement of images and notions, embodying our spontaneous inferences, then it has no existence independent of our perceptions, and would not exist if not perceived. Our notion of it is

undoubtedly a combination of percepts or of their representative ideas; but the apple itself is the combination of all the causes of the sensations which it occasions in us, together, perhaps, with other qualities altogether unknown. This combination of qualities and causes is not dependent on our perception for its existence, but our perception of it implies its existence. The apple does not exist because it is perceived, but it is perceived because it exists and is brought into relation to our powers of perception. It might even exist and not be perceived. No doubt many apples exist that have never been perceived by any human being.

The appearance may be regarded as the joint product of two factors—the underlying forces which are the causes of the sensations, and the mind which interprets the sensations by inferring and ideating their causes. If either factor of the product be removed, the product disappears. Take away the external forces, and the sensations will cease, and the appearance will vanish; change the forces, and the sensations will change and the appearance will also change; remove the mind, and there will be neither sensation nor perception. The appearance is not independent of the mind; but the apple, as a substance involving a collection of forces, is independent of the mind. Neither is the appearance independent of the external forces—a mere creation of the mind; for then there would be no cause of agreement in the appearances as constructed by different minds. But the appearances to two minds of the same object are essentially alike, which would not be the case if the appearances were exclusively subjective representations; hence the appearance, as a product, has an objective factor independent of the mind, and this factor is common to the appearances to the two minds, and is the cause of their agreement.

That the objects whose qualities, as causes, excite sensations in us, are independent of the mind, is also revealed by the fact that the mind can not create its sensations at will, since these sensations are forced upon the mind, which is passive in their reception. The laws governing the combination and succession of sensations are, therefore, the laws of a non-ego. Hence, there are causes independent of ourselves, which produce in us the sensations of which we are conscious. Strictly, sensations are the joint products of the external causes and the reactions of the internal sensibility. In perception, we pass judgment on the external causes, and construct our images so as to embody our notions of them as external objects independent of ourselves, which they are in reality, unless our minds are false and deceive us in their spontaneous, unprejudiced decisions. At the summit of thought, the conclusions of the Philosopher harmonize with the inspirations of the Poet.

> "Full many a gem of purest ray serene,
> The dark, unfathom'd caves of ocean bear;
> Full many a flower is born to blush unseen,
> And waste its sweetness on the desert air."

13th. The *utility* of sight is evident: it opens to us a world of marvelous beauty; it is swift and delicate, and far-reaching, taking in, at a glance, a wide spread landscape, locating its objects countless in number, marking the wonderful variety of forms, and the nicest shades of color; it reveals a multitude of worlds beyond our own, giving us the most sublime conceptions of the grandeur of Jehovah's empire. Indispensable is the information, infinite are the blessings, and exhaustless the pleasures which it confers.

## CHAPTER XII.

### ACQUIRED PERCEPTION.

**1. Original and acquired perception defined and illustrated.**—An *original perception* is a perception, through a single sense, of the quality of an external object, which is the appropriate cause of a sensation in the organ of that sense.

An *acquired perception* is the perception of the quality of an external object which would cause a sensation in the organ of one sense, through the original perception of a quality which does cause a sensation in the organ of another sense, from the knowledge gained by experience that these qualities are united in the same object.

The perception of the color of an extended object, through the sensation which that object causes in the eye, is an original perception; so also is the perception of a single quality of an external object, gained through a sensation in the organ of any other sense.

The visual idea formed of the appearance of a person, from hearing his voice, is an example of an acquired perception. Thus, I hear a well-known voice in an adjoining room, and say that my friend is in that room; and though I do not see him, yet I imagine how he would appear if seen. In this case, the image is not the person, who, by supposition, is not seen. This fact accords with the doctrine of the last chapter, that the appearance is an image constructed by the mind; for, if the image, in the absence of the corresponding sensation, that is, the sensation in the organ of the sense appro-

priate to that image, can be constructed under the stimulus of another sensation, much more can it be constructed under the stimulus of the proper sensation.

The image constructed under the stimulus of a sensation not corresponding to the image, is less distinct and more indeterminate than the image constructed under the stimulus of the appropriate sensation. Thus, on hearing the sound of the voice in the adjoining room, the image constructed may be consistent with the supposition that the person is sitting or standing. He may be in either posture, or in some other; but on going into the room, the ocular sensations caused by the person, will, by their definiteness, determine in what posture the image constructed under the influence of the sensation shall appear. If the person change his posture, the sensations will change, also the perception, thus revealing the fact that there is a reality present independent of our sensations; and this reality, by determining our sensations, determines our perceptions. Our perceptions, then, are not altogether voluntary, since, when the sensations are present, they are spontaneously determined by the mind informed by experience, and influenced by habit.

There is a great variety of acquired perceptions. Thus, I hear musical sounds, and know that they come from a violin, a piano, or a guitar, as the case may be, and imagine how the instrument looks. We say a glowing coal of fire looks hot, imagining, by its appearance to the eye, how it would feel to the hand. In like manner, on seeing an apple, we imagine how it would feel, or taste, or smell.

In original perception, the causes of the sensations are known through the sensations themselves; but in acquired perception, the cause of a sensation which would be experienced, if the object were brought into

relation to a certain sense, is inferred, on occasion of an original perception of the cause of another sensation actually experienced through another sense. Every act of acquired perception, therefore, involves a sensation, an original perception, an act of memory, and a representation by the imagination. The act, so far as the representation is concerned, is regulated by the *law of integration*, hereafter explained, by which the mind repeating any part of an entire process, tends to restore the whole.

**2. Acquired perceptions through smell.** — Through the sensation of *smell*, we not only perceive its cause, but represent, by the imagination, the object of which the cause of the sensation is a quality, as it would appear to the sight, touch, or taste. In this process, the representation involves memory and is governed by the law of association, guided by the light of experience.

Having learned by experience the peculiar odor exhaled from a given object, then whenever we experience that odor, we not only infer its cause as an exhalation from the object, but we imagine the object as it would appear through the other senses.

**3. Acquired perceptions through taste.** — Through the sensation of taste, we not only perceive the quality which is its cause, but we imagine the object of which that quality is a property, as it would appear to the other senses. Thus, in tasting an article of food in the dark, we know, for example, that it is an apple of a certain variety, having a certain color and other properties not originally known by taste.

**4. Acquired perceptions through touch.** — The original perceptions through *touch* are accompanied by acquired perceptions representing the objects as they would appear to the other senses.

**5. Acquired perceptions through hearing.** — Through

hearing, we have a variety of acquired perceptions. We hear a sound, and instantly know that it is, for example, the sound of a bell, and can, perhaps, tell what bell. We say that another sound comes from a drum, another from a coach. We strike a barrel, and know from the sound whether it is full or empty. We know from the tones of a person's voice whether he is pleased or angry, though we can not distinguish a word.

We are peculiarly liable to mistake in judging of the cause of sound. The rumbling of a wagon over a bridge may be mistaken for thunder; the hum of a musquito, for the blast of a bugle; the rattling of a spoon in a tea-cup, for sleigh-bells; the beating of the heart, for a rap at the door. The noise made by a pet squirrel turning the cylinder of its cage, was actually mistaken for the noise made by burglars drilling into a safe, and the police were called out to capture the thieves.

We judge the cause of any familiar noise, in the main correctly; but any unusual noise is apt to mislead us in our judgment concerning its cause; for we can learn this cause only by experience.

**6. Acquired perceptions through sight.** — Through *sight*, we have acquired perceptions of objects, representing them as they would appear through smell, taste, touch, and hearing. Thus, an orange at a short distance, as an object of visual sense, is simply a yellow circle; but by acquired perceptions it is represented as spherical, with a rough surface, as capable of exciting certain sensations of odor and taste, as naturally divisible into spherical ungula, and as probably having seeds.

But the most important of the acquired perceptions through sight are those relating to the magnitude, distance, and form of objects.

1st. The *real magnitude* of an object can be estimated from its distance and apparent magnitude.

Let $l$ denote a linear dimension of the real magnitude of an object; $d$ the distance; $v$ the visual angle subtended by $l$, at the distance $d$, or the linear dimension which, at a unit's distance, will just conceal $l$; then $v$ is the apparent magnitude of $l$.

Then, $l = v \times d$.

Hence, knowing the visual angle subtended by an object, that is, its apparent magnitude, and its distance, we can estimate its real magnitude. It is not asserted that an accurate estimate is made of the real magnitude of an object from its distance and apparent magnitude, but that, from the above relation, the mind makes an approximate estimate of the real magnitude.

If we are mistaken in regard to the distance, we shall fail to estimate correctly the real magnitude. Thus, I remember looking, at one time, through a window, and seeing, as I thought, at the distance of about eighty rods, a stub which appeared to be about fifty feet in height, and four feet in diameter. On approaching the window to obtain a better view, the object was found to be a mark on the light of glass, about one inch long, and one-twelfth of an inch in breadth. The perception of magnitude is, therefore a judgment which may be true or false, according as the assumed distance is correct or incorrect.

2d. The *distance* of an object can be estimated from its real and apparent magnitude.

Thus, $l = v \times d$; $\therefore d = \frac{l}{v}$.

A mistake in reference to the real magnitude is followed by an error in estimating the distance. If the magnitude is overestimated, the distance will likewise be overestimated, and the reverse. Thus, if a pigeon-house near by be mistaken for a church, it will appear half a mile distant.

We also estimate the distance of an object from the change in its apparent size and direction caused by changing our own position. The nearer the object, the greater is the change in apparent size and direction, as we change our position.

We can judge of the distance between two objects nearly in the same direction, by the rate of the apparent change in this distance, as we advance at right angles to that direction. The farther the objects are apart, the more rapidly will the apparent distance between them increase.

Intermediate objects have the effect of augmenting apparent distance. A meadow with numerous hay-stacks scattered here and there, seems larger than when the stacks are removed. A harbor appears larger when containing a great number of vessels than it does when the vessels have nearly or quite all sailed away. A river seems narrower when viewed from bank to bank than it is in reality.

Multitude seems to augment magnitude or duration. A certain distance expressed in feet seems greater than the same distance expressed in miles. A period of time seems longer when expressed in hours than when expressed in years.

Distance is also estimated from brightness or dimness of color, clearness or obscurity of outline, distinctness or indistinctness of parts. Other things being equal, the distance is less as the color is brighter, the outline sharper, or the parts more distinct; and the distance is greater, as the color is dimmer, the outline more obscure, or the parts more indistinct. The distance being estimated in this way, the real magnitude can be determined from the apparent magnitude. In an adjoining field, the colors of the objects are bright, their outlines clear, and their parts distinguishable; but in a distant

field of similar character, the colors of the objects are dim, their outlines obscure, and their parts indistinguishable. In a neighboring grove, we can distinguish, not only the individual trees, but also their branches and leaves; while in the distant forest, we can not distinguish the leaves, nor the branches, nor scarcely the individual trees.

A ship seen through a fog appears farther off than it is in reality. An English traveler, when first visiting Italy, judges the mountains to be much nearer than they actually are, on account of the clearness of outline and distinctness of parts, as seen through the transparent atmosphere of that country.

On account of the smoke, fog, and mist near the earth, the atmosphere, viewed in the direction of the zenith, appears clearer than when viewed in the direction of the horizon; hence, the apparent vault of the heavens is not a hemisphere, its vertical radius being less than its horizontal, making the horizon appear much more distant than the zenith, causing the shape of the celestial vault to resemble the concave side of the crystal of a watch. This appearance is also augmented by intervening objects seen along the earth in the direction of the horizon. On account of this apparent shape of the celestial vault, the sun and moon appear farther off when in the horizon than when in the zenith; and since the visual angles subtended by these objects are nearly the same in the two cases, being imperceptibly less in the horizon than in the zenith, the linear magnitude, which varies directly with the distance when the visual angle is constant, is judged to be greater. The farther off an object appears, the visual angle remaining the same, the larger that object appears.

3d. The *magnitude* of an object can be estimated by *comparison*. Let $v$, $v'$, respectively, be the visual angles

subtended by the respective linear dimensions, $l$, $l'$, of two objects whose distances from the observer are, respectively, $d$, $d'$.

Then, $l = v \times d$, and $l' = v' \times d'$.

Hence, $\frac{l}{l'} = \frac{v}{v'} \times \frac{d}{d'}$; $\therefore\ l = l' \times \frac{v}{v'} \times \frac{d}{d'}$.

If the objects are equidistant, $d = d'$, and $l = l' \times \frac{v}{v'}$.

It is not asserted that in estimating size by comparison, the mind always makes an accurate computation. The above formulas express scientifically the mathematical relations which, though admitting of clear apprehension and exact application, are, perhaps, for the most part, vaguely apprehended and unconsciously applied. If we mistake in regard to the magnitude of $l'$, we shall fail in correctly estimating the magnitude of $l$. Thus, Dr. Abercrombie on going up Ludgate Hill towards the great door of St. Paul's Church, took several persons who were standing in the doorway to be children; but on coming up, he found them to be men. He had compared them with the door, which was larger than he had supposed, and this mistake in regard to the size of the door, led to an incorrect estimate of the size of the men; and, judging them to be smaller than they were in reality, he mistook them for children. The mistake originated in underestimating the distance of the church, which led to the underestimate of the size of the door.

4th. The *form* of bodies involving the third dimension, *depth*, must be learned originally by touch; yet the eye, trained by touch, interprets with surprising rapidity the signs which indicate the form of bodies. When looking at a sphere, we see only a circular disk; but the transitions of color, the blending of light and shade are of

such a character, that we perceive that the object is a sphere and not a circle. We have learned by experience to interpret the signs of form, and can thus readily distinguish one object from another. The painting representing a sphere is really a circle which reflects light as a sphere reflects it; and since the painting of a sphere causes the same sensations as the sphere itself, these sensations are interpreted in the usual way, and the painting is imagined to be a sphere.

Till the mind learns to interpret the signs of a third dimension, a solid appears to the eye as a plane surface. This is proved beyond question in case of the blind when first restored to sight. A painting of a landscape appears to them to be a flat surface, as it is in reality, with variegated colors, light, and shade. They have not yet learned to interpret, by the sense of sight, the signs of distance, magnitude, and form, involving the third dimension. But when the mind has learned to interpret the signs of the third dimension, and of distance, it will, whenever these signs appear, perceive the third dimension, and, in the majority of cases, judge with wonderful correctness, the true distance of the object. The sign and the interpretation become so associated, that when the sign appears, the interpretation,—that is, the inference with the ideation—follows.

The art of painting, therefore, consists in the skill to make on a surface such a representation of an object as will reflect color, light, and shade to the eye, as the object itself would reflect them. The color, light, and shade, as signs of form, coming from the object, are correctly interpreted, and the form of the object is perceived; but these signs coming from the painting, just as they come from the object, causing similar sensations, are interpreted as if coming from the object, and this is done even when we know that we are looking at

the painting of the object and not at the object itself; and thus the constructive imagination sees in the painting an object having three divisions. If we did not know that we were looking at a painting, we should believe that we were looking at the object which the painting represents.

It is undoubtedly true that, if we had, by any means, such sensations as those caused by the objects which now surround us, we should seem to perceive these objects, though they were not present. Such pseudo-perceptions sometimes occur in case of the abnormal action of the organs of vision; but in normal cases, the sensations require external causes as the conditions of their existence. The ideated judgments concerning the causes of the sensations are the products of the perception of the objects.

## CHAPTER XIII.

### DEVELOPMENT AND PRODUCT OF PERCEPTION.

**The development** of the powers of perception in children is effected by their endeavors to learn the properties and relations of external things. They make many experiments, and learn by success or by failure.

The several senses, the instinctive tendencies, and the faculties of sensation, intuition, inference, and ideation, must be assumed as original.

At first, the perceptions which follow the sensations are obscure and indistinct. A sensation, perhaps of pleasure or of pain, more decided than usual, attracts the attention, which is withdrawn from other sensations, and an effort is made to enjoy the pleasure or to avoid the pain. Two or more senses may be employed at the same time, giving groups of sensations which are found to be simultaneous or successive, and these become so intimately associated that when one is experienced the others are expected.

Intuition awakes and asserts that the sensations have causes. The cause of a sensation is discovered by investigation, one sense testing or correcting the decisions of another.

The knowledge of a single quality of an object, gained through a single sense, is a percept, which may be ideated or represented by the imagination. The various percepts relating to the object, or the ideas representative of the percepts, may be combined, giving a more perfect knowledge of the object.

The hand and the eye are the principal organs of investigation and media of perception. The soul first acquires a knowledge of its own body by means of the muscular and the tactual sensations. Thus, when the hand is pressed upon the body, the muscular sensations give the portion of the sensorium which is the locus of the sensation, and the tactual sensations give to this portion its limit or bounding surface. The surface of the body is also revealed by glowing warmth or creeping chill.

By comparing the double sensation experienced when the hand is placed on a portion of the body with the single sensation experienced when the hand is applied to an external body, as a chair or an apple, the mind begins to perceive that these are objects exterior to its own body.

When one hand grasps the other, the sensations within the hand grasped reveal magnitude, the relative extent of which the grasping hand measures. This measure will reveal the relative magnitude of another object grasped, as equal to, greater, or less than, the hand grasped, according to the degree of opening of the grasping hand.

By moving the hand along the arm, magnitude is revealed by the loci of the successive sensations, and the relative extent of this magnitude is measured by the muscular sensations connected with the movement of the hand. By comparing these sensations with the muscular sensations experienced when the hand is moved along another body, the comparative size of this body can be estimated. Such experiments are attended with ocular perceptions. The mind is conscious, not of the image on the retina, but of the sensations, the cause of which it objectifies and locates, guided by the sense of touch, and thus it comes into possession of the visible

signs of external objects in addition to the tactual and the muscular. Objects as seen, are found to resist our locomotive energy, and it is thus known that they are not phantasms, but real external powers. The forms of objects as seen are learned more perfectly by handling them, so as to be afterwards detected by sight alone.

The positions of objects, as near or remote, are learned by going to them; and thus by experience, gradually acquired, we learn to locate objects by sight alone, in their true positions, and to take in, at a glance, the salient features of a landscape.

That the eye needs the tutorship of touch is evident from the experience of those once blind, after they have been restored to sight. They are, at first, unable to interpret pictures or drawings, or by sight alone to perceive the true form, size, or position of objects. To them, the various objects of a landscape, seen through a window, seem to be variegated colors in contact with the glass.

The percepts of an object acquired through all the various senses are ideated and combined into a complex idea of the object. Any one of these percepts or its idea being given, the mind imagines the object as it would appear through any other sense or through all the other senses.

We have found that a percept is the knowledge of a quality of an external object, gained by original perception through the sensation in the organ of a single sense. A percept is developed into an idea which is committed to the keeping of the memory, reproduced in the imagination, and recognized as the representative of the percept.

By acquired perception, guided by experience, the representative idea of a percept gained through one sense, is, by the law of association, reproduced sponta-

neously in the imagination, on the occasion of the original perception of another quality of the external object, through the sensation in the organ of another sense. This idea may also be recalled by the name of the object. Each original perception gives us a distinct percept corresponding to a distinct quality in the object. Two or more original perceptions may be simultaneous, forming a complex perception, or original and acquired perceptions may combine. The ideas of two or more percepts may be combined, giving a complex idea which more or less truthfully represents the complex knowledge of the object, as acquired by original perception.

The combination of all our percepts of an object constitutes our knowledge of the object as perceived. The combination of all our ideas of these percepts constitutes our notion of the object as conceived. The object itself is the combination of all the qualities known as the objects of our percepts, together with all its other qualities and powers. The object, as a substance involving a combination of forces, is independent of the mind.

A material body perceived as extended implies space, at least the space which it occupies. Two or more bodies reciprocally external, imply not only the space occupied by them, but the space between them. A body in motion implies the space through which it moves. The fact that a body can move indefinitely in any direction implies space surrounding the body on all sides, and extending indefinitely. Space, then, is the logical antecedent or necessary condition of body — that without which body can not be; hence, since body is, space must be. A body is perceived or represented in its relation to space, as occupying a portion of space, and as contained in space; that is, as surrounded by space on all sides, and as either at rest in space, or in motion through space.

Successive psychical changes imply time. A material body perceived as enduring simultaneously with psychical changes in the ego, implies the time through which it endures. Two bodies enduring in a certain form, through different periods, not consecutive, imply not only the periods through which they endure, but the period included between these periods. The fact that the period through which a body endures, in a certain state, may be both preceded and followed by the periods through which other bodies endure, proves that the finite period through which a body endures in a certain state, is a portion of a greater period extending indefinitely before and after the given period.

Successive changes in the state of a body also imply time. The period of a body in a certain state may be considered with reference to its date, or time when, and with reference to its duration, or time how long. Time, then, is the logical antecedent or necessary condition of a body as enduring or as exhibiting successive changes —that is, time must be in order that a body may endure and exhibit successive changes; hence, since a body does endure and exhibit successive changes, time must be. A body is perceived or represented in its relation to time in reference to its date, or location of its period in indefinite time, and in reference to its duration, or the quantity of indefinite time contained in its period.

A material object is not to be regarded merely as a combination of qualities or attributes; nor is one quality to be regarded as the substance of which the other qualities are the attributes. The substance is the common ground, substratum, or underlying power, involving a combination of forces which manifest the qualities or attributes of the body. The same object which exhibits qualities which are the objects of visual percepts, also manifests qualities which are the objects of percepts cor-

responding to the other senses. These qualities are perceived as the causes of sensations in us, and are referred to the substance as their common ground, or as the power involving the forces which manifest them as attributes.

The percepts relating to these qualities, as attributes of a substance, are ideated and combined into a complex idea or notion of the object which is represented in its relations to space and time. These complex ideas, as ideal objects or creations of the mind in ideal space and time, are the representatives, more or less truthful and complete, of our knowledge of the real objects, as they were perceived to exist in real space and time. The conditional necessity of substance as the ground or substratum of the qualities which are the causes of sensations in us, is not an object of perception through any sense, but is apprehended by rational intuition.

## CHAPTER XIV.

### ERRORS IN PERCEPTION.

**Errors in perception** are not errors in sensation; for we are directly conscious of sensation, leaving no room for error. Neither are errors in perception errors of intuition, which affirms that sensations have causes. But the error is found in the inference which judges concerning the cause of the sensation. It arises from a misinterpretation of a sense-impression, that is, from an erroneous inference respecting the cause of a sensation, which inference, when ideated, becomes an illusive appearance, not corresponding to the reality.

These illusions are reducible to three classes, according as the cause of the erroneous inference is objective, subjective, or both objective and subjective.

1st. An *objective, passive, or a posteriori* illusion is one due to something in the object which gives a sense-impression similar to that which would be given by the object supposed to be perceived. The object thus suggested is erroneously inferred and ideated, or represented by the imagination. Thus, a person may imagine he sees a ghost, because he happens, in the obscurity of the night, to see something which strikingly corresponds to those descriptions of apparitions with which he has become familiar.

2d. *A subjective, active, or a priori* illusion is one due to some preconception, or some pre-existing activity, which, by awakening expectation, predisposes the mind to certain inferences. The object thus anticipated is,

under favorable conditions, readily imagined and believed to be perceived. Thus, a person visiting at night, a house which he knows has the reputation of being haunted, will be quite likely to see a ghost, especially if he is superstitious and has a lively imagination.

3d. An illusion both *objective* and *subjective* is due both to the peculiarity of the sensation caused by the object, and to the pre-occupation in the mind of the subject. This is the most common case. Illusions purely objective, or purely subjective, are comparatively rare. Most commonly the suggesting circumstance and the anticipation co-operate in causing the illusion. Thus, in ghost-seeing, there is usually an external suggesting object of ghost-like form, seen by a mind preoccupied with fearful anticipations of beholding an apparition. The suggesting sensation is quickly misinterpreted and represented by the excited imagination in accordance with the dreaded anticipation.

An object may erroneously be regarded as beautiful, either because it has certain elements suggesting the beauty which the mind imagines and embodies in the object, or because the mind is in a state of expectancy in regard to beauty, and thus imagines it in the absence of those external qualities usually called beautiful, or more commonly because both causes, the suggesting elements and the expectancy conspire to elicit the erroneous inference, which is ideated, objectified, and embodied in the object. This will account, in part at least, for the differences which exist in different minds with regard to the beauty of objects, notwithstanding very general agreements.

Similar errors may arise in interpreting the looks or words of another, when these words are regarded as signs of mental states or of disposition or character. The error may arise from the sign, from the anticipation, or

from both. The error is eliminated, in a high degree of probability, when many persons agree in drawing the same inference from the same indication; but when two persons draw conflicting conclusions from the same look or word of a third person, one, at least, is in error, and the error is probably one of anticipation.

If the angular gyrus be affected as it would be affected by any external object presented to the eye, whether that affection be a spontaneous cell-grouping of itself, or whether it be an effect sent up from an excitement of the retina or of the tubercula quadrigemina, caused by stimulants or by disease, or whether it be an effect of a preconception or a misconception sent down from the frontal lobes, the angular gyrus will transmit the same report to the frontal lobes as if the supposed object were actually present, and that object will appear to be seen. The phenomenon, in this case, differs from the idea of the object as reproduced from memory, by the imagination, since in the latter case there is no corresponding sensation; whereas, in the supposed case, the sensation is as real, and the appearance as vivid, as if the object were actually present and normally perceived.

If the nerves of any organ of sense be definitely excited, normally or abnormally, there will be a sensation followed by a perception or inferential judgment corresponding to the excitement and to the sense whose organ is excited. Thus, an excitement of the optic nerve is accompanied with the phenomena of vision; an excitement of the auditory nerve is attended by the phenomena of hearing, and so on for the other senses. The sensation is real, and the cause is real, but there may be error in the inference as to the nature of the cause.

It is possible that causes somewhat diverse may produce similar effects. A tree before the eye excites the

nerves of the eye in a certain manner, and this excitement produces a sensation, followed by the perception of the tree. Now, if the nerves of the eye could, in any other way, be excited in the same manner, this excitement would produce a similar sensation, followed by a similar perception, and there would be an apparent perception of the tree, though the tree were not present.

A straight stick thrust obliquely into the water appears bent; but this is owing to the refraction of the light at the surface of the water, causing the straight stick to make the same image, and thus to produce the same sensation as that caused by a bent stick; and hence, the mind interpreting the sensation as it has been accustomed to do, sees the stick bent. The error, if the stick is believed to be bent, arises from not recognizing the fact that dissimilar causes under different conditions may produce similar effects. The sensation is the same as that produced by a bent stick in the air; and so frequent has been the association of the sensation produced by a bent stick with the cause of the sensation, in ordinary cases, that a standard for judgment has been formed which is applied in the given case; hence, the straight stick in the water, giving the same sensation as a bent stick in the air is, in accordance with the habitual sensation, by a spontaneous inference, seen bent. We can not get rid of the appearance of a bent stick, even after we have learned that the appearance is an illusion caused by the refracting power of the water. The stick will appear bent even after we believe or know it to be straight. The appearance is a spontaneous creation by the imagination, embodying the judgment spontaneously inferred in accordance with habitual association, in case of such sensations. The judgment is not reflective or scientific; for such a judgment would conclude the stick to be straight. The judgment

is, therefore, spontaneous or constitutional; but the constitutional power which asserts the judgment, is not wholly original, as is the constitution of the sensibility which reports the sensation, but is in part, at least, acquired by the plastic influence of experience and habit.

If we look at a pencil held near the eyes, and at the same time, see a more distant object, in the same range, without directing especial attention to it, that object will appear double; but if we direct attention to the distant object, the pencil will appear double. The reason is, in the one case, the optic axes are adjusted to the distance of the pencil, and in the other, to the distance of the object, causing, in the first case, the distant object, and in the second case, the pencil, to produce images on the retinas of the two eyes, such as would be caused, when the optic axes are normally adjusted, by two objects, one causing an image in one eye, the other in the other eye. The sensations being the same as those caused by the two objects, the judgment follows the usual law in inferring the cause, and the imagination constructs the appearance accordingly.

If a person should suddenly become cross-eyed, he would see double, for the reason that the same object would cause sensations on dissimilar parts of the retinas of the two eyes, such as could be caused, when the eyes were in their normal condition, only by two objects; hence, the one object would appear, under the influence of the established association for the normal case, as two objects. If the person should remain cross-eyed for a considerable length of time, his ocular perceptions being corrected by touch, he would gradually acquire the power to see single, or one object would appear as one; and this would be the case, though he did not become blind in one eye, as is the tendency in cross-eyed per-

sons. If a cross-eyed person, who had acquired the power to see single, should have his eyes straightened, he would, at first, see double, because one object would now make images in the two eyes in such places on the retinas as could have been made only by two objects before his eyes were straightened.

Roll a sheet of paper into a tube about one inch in diameter. Look through the tube with one eye, and at the hand placed close by the side of the tube with the other. A hole the size of the tube will appear in the hand, through which objects are visible. The reason is, that though an object, as a door, may be concealed from one eye by the hand, a small circular portion of the object is seen with the other eye through the tube, giving the same appearance as if that portion were actually seen through a hole in the hand. A spot on the hand where the hole appears will disappear, if attention is directed to objects seen through the tube; but if attention be directed to the hand, the spot will appear in the hole, as if seen through the tube.

A person seen at a distance is judged to be a certain individual, and the perception seems quite clear, though it be erroneous, as afterwards found. On approaching nearer, certain signs appear inconsistent with the first judgment, and the perception becomes indecisive. Approaching still nearer, a new judgment is formed, and he is seen to be another person, very different, perhaps, from the one first supposed, and the perception again becomes clear and distinct. The sensations caused by the person, when at a distance, were, from their somewhat indeterminate character, not inconsistent with the first supposition, and there were positive elements favoring this supposition; but as he approached, elements appeared rendering this supposition improbable. A still nearer approach, rendered the sensations more definite,

and determined the final judgment, and made clear and decisive the perception.

Tactual sensations may lead to erroneous perceptions. If we cross the fingers, and place some small object, as a pencil, between their tips, it will be felt as two. The reason is, when the fingers are in their natural position, one pencil could not give the sensations which it gives when the fingers are crossed; but two pencils could give these sensations, as we find by trial. The one pencil, then, between the fingers crossed, giving similar sensations to those given by the two pencils when the fingers are not crossed, the sensations being interpreted according to established associations for the normal case, when the fingers are not crossed, is perceived as two pencils.

A person who has had a foot amputated, will seem to feel pain in that foot, for the reason that the nerves of the remaining part of the limb are affected as they would be by an injury done to the foot, were it remaining, and hence the perception.

Many other interesting examples of errors in perception will occur to the reflective mind, and the explanation of these errors will illustrate the nature of the process of perception itself.

## CHAPTER XV.

### PASSIVITY AND ACTIVITY AND CONDITIONS.

**1. The state** of the soul in perception, its *passivity* or *activity*, requires attention. The soul is *passive* in sensation, in this sense, that, when the conditions of sensation are complied with—that is, when excitants are brought into relation with the sensorium, the sensation caused by the action of the excitants and the reaction of the sensibility is experienced without an act of the will. The conditions of sensation being complied with, as when a lump of sugar is placed in the mouth, the sensation follows, not only without any voluntary action of the soul to induce it, but in spite of any effort to prevent it or to change its character.

The soul may be *active* in reference to sensation, in voluntarily complying with the conditions of sensation, as in putting sugar into the mouth in view of causing the sensation, or in reflecting on sensation, as in abstracting the attention from other things and directing it to its sensations, that thus by comparing them it may note their resemblances and differences and classify them accordingly. It will be observed that this activity is not in the sensation, but relates to the sensation.

The soul is *passive* in perception, in this sense, that when the object is presented, the perception is determined so as to correspond to the object. Thus, in clear perception, the mind can not see a man to be a horse. The character of the perception is, in part, determined by the nature of the sensation caused by the object.

The passivity of the soul in sensation and perception is a clear indication of other objects than ourselves. These objects causing our sensations and determining our perceptions, without volition, establish the existence of an external world, and disprove absolute idealism.

The soul can be *active* in perception in several ways: It can abstract its attention from many objects, and direct it to a few, in order to gain clear and distinct perceptions. The mind can, at pleasure, attend to certain objects, for the time neglecting others.

The soul can, by special effort, innervate a single sense, thus rendering it susceptible of more vivid sensations; and by concentrating its attention on these sensations, can obtain the most clear and distinct perceptions. We sometimes suspend the action of one sense, that we may increase that of another, as when we close the eyes that we may hear the more intently.

The activity of the mind in perception is exemplified in the process of ideation, by which the percepts are developed into ideas, and combined into complex images, which, as representative of the object, can be retained and recalled at pleasure, though the original objects themselves are absent.

The clear perceptions and completed ideas of objects which we have in mature years, are the fruits of many experiences and attempts, perhaps now forgotten, to gain a knowledge of these objects. We seem to perceive objects by a passive impression, when, in reality, the perception is the resultant of the mind's activity in combining the percepts acquired through the present sensations with the ideas which the mind has already in possession, in respect to the given objects, or to objects of the same class, or even to objects more remotely related to those under consideration.

The activity of the mind in perception is manifest in

the widely different results attained by different persons from their inspection of the same object. Each will find something entirely overlooked by the others. What each sees, depends not only on the object, but also on the knowledge, culture, habits, occupation, character, and condition of the observer.

Activity and passivity are, therefore, both present in sensation and perception. Though both are present, yet sometimes one preponderates and sometimes the other; and from the preponderance of the one element over the other, in a certain modification of mind, we style that modification active or passive, as the case may be. It may be observed that we are not conscious of pure passivity. Consciousness is cognizant of the reaction of the soul against the action of a foreign cause.

**2. The conditions** of clear and distinct perception are the following:

1st. The general conditions of perception — an object, and a subject, and the relation of the two.

2d. Abstraction of the attention from other things except the object under consideration, thus avoiding distraction.

3d. Concentration and continuance of the attention upon the object till the perceptions gained by simple inspection through the several senses, become clear and distinct.

4th. An examination of the object from different points of view, on different sides, and under different conditions.

5th. An examination of the parts of the object in detail, thus securing greater concentration of attention, and proportionally clear and distinct perception.

6th. A comparison of the object with other objects, both similar and dissimilar, thus obtaining resemblances and contrasts.

7th. Classification of the object with its species.

8th. Repetition of the examination, if necessary, observing the above conditions, till satisfactory results are reached.

The results of clear and distinct perceptions, when ideated, become permanent and valuable possessions, and are essential conditions to the proper performance of the higher operations of representation and elaboration.

3. The *properties of matter* are given for reference. They are the primary, secundo-primary, and secondary.

1st. The *primary properties* relate to space or time.

(1) As to *space*, a body occupies space and is contained in space;—as occupying space, it has magnitude, form, divisibility, and ultimate incompressibility; and as contained in space, it has mobility and situation.

(2) As to *time*, a body has duration or renewal of state and date of change.

2d. The *secundo-primary properties* result from inertia, co-attraction, and repulsion.

*Inertia*, or want of power in a body to change its state as to rest or motion, is a mechanical fact, not a chemical.

*Co-attraction* embraces gravity, cohesion, and affinity, also capillary, electrical, and magnetic attraction.

*Repulsion* may result from compression, heat, electricity, or magnetism.

From co-attraction and repulsion result the following pairs of properties: Hard and soft, solid and fluid, viscid and friable, tough and brittle, rigid and flexible, fissile and infissile, ductile and inductile, elastic and inelastic, slippery and adhesive, crystallized and uncrystallized.

3d. The *secondary properties* are the causes of such sensations in us as those of odor, flavor, touch, sound, and color. These properties are in their nature occult, and in their varieties innumerable.

## CHAPTER XVI.

### THEORIES OF PERCEPTION.

1. **The Ionic philosophers,** following the lead of Thales, directed their attention to physical phenomena, which they attempted to generalize by induction. They sought for the material principle of things, and the manner of their generation and decay; but they gave no further explanation of perception than that phenomena result from the peculiarities of matter, which, in their opinion, is endowed with life.

2. **Pythagoras** found the principle of things in number and figure, but threw no light on preception.

3. The **Eleatic philosophers.** Xenophanes, Parmenides, and Zeno, were eminently metaphysical and idealistic. They regarded the phenomena of sense as illusive, reason alone giving true knowledge.

4. **Empedocles** thought that bodies send off effluxes which enter the pores of the various senses, and occasion perception. In the case of vision, effluxes also pass out from the eye, and the meeting of the two streams gives rise to perception. Empedocles laid it down as an axiom, that the object known, and the subject which knows, must be of like nature — an assumption, which, as Hamilton has shown, has exerted a powerful influence on philosophy from the very earliest to the very latest speculations.

5. **Democritus** maintained that all forms of being are resolvable into matter composed of atoms differing in size and shape. The soul differs from the body only in

the fact that it is composed of finer particles. Perception is occasioned by contact; hence, all the other senses are only modifications of touch. That which is brought into contact with the soul, is not the material object itself, but images of that object. These images are detached from the object and projected through the pores of the organs of the various senses.

6. **Plato** held that sensation is the product of the joint action of the external object and the sentient agent. As the individual factor varies, sensations vary. They are not necessarily the same in all persons, nor the same in the same person in different circumstances. As variable and contingent, they are unreliable; hence, perception through sensation, is illusive and untrustworthy.

7. **Aristotle** maintained that all knowledge begins with the individual, and is grounded on sensuous perception. He discriminated between sensation and perception, holding that we have certain knowledge of sensation, but that we are liable to error in our judgments through sensation. He also considered the physical media and conditions of perception, but made little advancement in the knowledge of the structure and functions of the organs of the senses. Each sense perceives its own object, as the eye color, the ear sound, and so on, for the other senses; hence, objects are not themselves perceived, but their species or perceptible forms. He held that there is a common sensory whose seat is in the heart, where the several senses meet. All objects have motion or rest, number, magnitude, and form.

8. The **Medieval philosophers**, or *Schoolmen*, followed the doctrines of Aristotle, modified, to some extent, by those of Plato. They held that material objects themselves are not immediately perceived, but only their species or images. In support of this opinion, they gave the following reasons:

1st. The object itself, when apparently perceived, is frequently not in contact with the organ of sense.

2d. The object is material, while the soul is spiritual, and the two being totally unlike, can not act upon one another. The object can not, therefore, affect the soul, and hence the soul can not perceive the object.

3d. Every thing immediately known must be in the mind, but this can not be true of the distant object.

4th. The object itself does not vary, but the appearance varies, as when objects are seen at different distances, or as images seen in a moving looking-glass. A person seems to see himself behind the glass, when, in reality, he is before it. Hence, the appearance is only the species, or image, and not the real object itself.

The more intelligent of the schoolmen did not regard the species as material. In this respect, their views closely approximated to the view which we hold to be correct, that the appearance is a spontaneous construction by the mind itself, made to account for the sensation caused by the object. In making this construction, the mind is guided by the light of experience.

The schoolmen maintained that the image acting on the organ of sense incites the mind to perceive the object itself. This doctrine prepared the way for the gross doctrine of an intermediate material image representing the object. The distant object does indeed reflect light to the eye, but light itself is not an image. There is, it is true, an image formed on the retina, but of this image the soul is not conscious. The appearance, which is a combination of percepts, or the embodiment of our judgments concerning the cause of our sensations, is a consequent, but not the cause of sensation, and hence is not the object itself, but is our idea of the object.

**9. Descartes** assumed nothing. In fact, he doubted every thing which it was possible for him to doubt;

but he found one thing, the fact of thinking, which he could not doubt. In the system of Descartes, every psychical act is thought. Of thinking, he was directly conscious, and doubt was excluded; but thinking involves the existence of a thinker. Descartes stated the principle thus: *Cogito, ergo sum.* I think, therefore I am. This statement has sometimes been criticised, as involving the *petitio principii;* for, it is said, *Ego* is involved as the subject of *cogito,* and need not, therefore, be inferred as the subject of *sum.* But Descartes evidently meant that the fact of his existence was revealed to him through his consciousness of thinking, which is fundamental and indubitable.

The next step was to find a warrant for passing from the ego to the world without, which would reassure us of the trustworthiness of our senses, and the validity of perception. This warrant Descartes found in God. He says: "When the mind reviews the different ideas that are in it, it discovers what is by far the chief among them — that of a Being omniscient, all powerful, and absolutely perfect; and it observes that in this idea there is contained not only possible and contingent existence, as in the ideas of all other things which it clearly perceives, but existence absolutely necessary and external. . . . . So from its perceiving necessary and external existence to be comprised in the idea which it has of an all-perfect Being, it ought manifestly to conclude that this all-perfect Being exists." *Principles,* Part I., 14.

But how does God, the Infinite and Perfect, warrant our belief in the existence of matter external to ourselves? Descartes says: "God would, without question, deserve to be regarded as a deceiver, if He directly and of Himself presented to our mind the idea of this extended matter, or merely caused it to be presented to us by some object which possessed neither extension, figure,

nor motion. For we clearly conceive this matter as entirely distinct from God, and from ourselves, or from our minds, and appear even clearly to discover that the idea of it is formed in us on occasion of objects existing out of our minds, to which the idea is in every respect similar. But since God can not deceive us,—for this is repugnant to his nature, as has already been remarked,—we must unhesitatingly conclude that there exist certain objects, extended in length, breadth, and thickness, and possessing all those properties which are clearly apprehended to belong to what is extended, and this extended substance we call body or matter." *Principles*, Part II., 1.

The essential quality of matter, according to Descartes, is extension. The other qualities, such as hardness, color, etc., are variable, and therefore accidental.

The following points may be noted in the theory of Descartes:

1st. In basing his theory on the facts of consciousness, he not only laid the immovable foundation of the edifice of truth, but he introduced the psychological *method*, and thus became the founder of Modern Philosophy.

2d. He distinguished sharply between matter as that which is extended, and mind as that which thinks.

3d. In his attempted demonstration of the existence of God, Descartes assumes that whatever we clearly conceive to exist, must have an objective existence. This may be questioned. The existence of God, the Infinite and Perfect, may, however, be legitimately demonstrated from the principle of causality. Then his veracity, as involved in his perfection, may be taken as the warrant for the trustworthiness of our faculties.

4th. In saying that the idea of an object is, in every way, similar to the object, Descartes uses the word *similar* with some latitude. The body may be hard, but our idea of it can not, with propriety, be said to be

hard. Our knowledge of an object is embodied in our idea of that object.

5th. Descartes is unquestionably right in concluding that because our perceptions are, in part, beyond our control, they are, in some way, caused by a *non-ego.*

6th. Descartes introduced the doctrine of special Divine interposition by which an extended substance is represented to an inextended mind; for he says, "we appear even clearly to discover that the idea of it is formed in us, on occasion of objects existing out of our minds." Did Descartes mean that the idea is formed in us by our own power, or by the power of God? He meant the latter; for he adds: "But since God can not deceive us, for this is repugnant to his nature, we must unhesitatingly conclude that there exists a certain object, extended in length, breadth, and thickness."

7th. In consequence of this doctrine of Divine interposition in the perception of matter, it was not necessary for Descartes to consider matter endowed with dynamical properties. He therefore regarded extension as the sole essential quality of matter.

**10. Malebranch** distinguished four elements in perception—the action of external objects on the body; the affection of the organ acted on; the sensation of the soul consequent on the affection of the organ; the judgment consequent on the sensation.

He rigorously applied the Cartesian precept, that mind and matter are two absolutely distinct and heterogeneous entities, and hence that it is impossible that there should be any causal relation or natural connection between them; therefore our ideas of material objects must be produced in us by the power of God. Spirits exist in God, the place of Spirits, and thus perceive the Divine ideas of material objects. We hence participate in the Divine knowledge, or see all things in God

As held by Malebranch and by Cartesians generally, the idea is an entity distinct from the object and from the activity of the percipient mind. In this view, ideas are pictures of things in the mind of God. These ideas, as pictures of objects, must be truthful, since they are God's representations of objects. In perceiving these ideas directly, we have an indirect knowledge of the objects which they represent.

The following points may be noted in Malebranch's theory:

1st. The Cartesian theory of perception was developed with more clearness by Malebranch than by Descartes himself, as is seen by the clearness with which he discriminated between the elements of perception; two of these elements, however, the action of external objects upon the body, and the affection of the organ acted on, are rather conditions of sensation, than elements of perception; the other two, the sensation of the soul consequent upon the affection of the organ, and the judgment consequent upon the sensation, are proper elements of perception. Two other elements of perception, the intuition of the necessity of the subject and object, and the ideation of the inferential judgment, were omitted by him altogether.

2d. If external objects act on the organization, as Malebranch maintains, he can not deny to these objects dynamical properties; but this was done by the other Cartesians.

3d. The excitement in the organ can not be the cause of the sensation, if matter can not act on mind, but it is only the *occasion* on which God causes the sensation, and presents the idea to the soul. This phase of the doctrine, called *Occasionalism*, was developed by *Geulinx*.

4th. The sensations seem to serve no other purpose than to call attention to the idea in the mind of God.

**5th.** The judgment which Malebranch speaks of as following sensation, is, according to his theory, but the perception of the idea in the mind of God. The truth is, however, that the judgment is the conclusion which the mind reaches concerning the objective cause of the sensation. The idea, instead of being the picture of the object which God forms in his own mind, is, in fact, only the embodiment, in the form of a mental image, of the judgment formed by our own minds, concerning the qualities of the object which causes the sensation.

**11. Spinoza** held that thought and extension are phenomena of one common substance underlying both, and that this substance is God, the Infinite and Perfect. Thought and extension are indeed phenomenally distinct, so that there can be no causal or direct cognitive relation between them; but as both are phenomena of one common substance, there is a correspondence between them — the thought corresponding to the thing, the idea to the object, and in this correspondence is found the explanation of the fact of perception.

**12. Arnauld,** a Jansenist and a friend of the Cartesian tendency, held that what the soul perceives is not the idea of the object, but the object itself. The idea is the perception. The words idea and perception, do not denote two entities, but one modification of the soul in two relations. Perception is the modification in the act of perceiving, while the idea is this modification as the expression of our conclusion in regard to the object. Ideas, as distinct from the act of perception, have no existence. The soul is active in perception, and perceives material objects directly, otherwise it could not know that its ideas correctly represent the objects. It can be affirmed, with as good reason, that the soul perceives material objects directly, as that it is directly conscious of its own acts and states.

These views are very suggestive, and tend in the right direction. Though it is true that the original ideas of objects have no existence, as distinct from the act of perception, yet ideas in representation have such an existence. In the representation of absent objects, there is no accompanying perception, though a past perception is implied.

The soul, as an intelligent, sensitive spirit, can not fail to be conscious of its own acts or states, which are modifications of its own energies or receptivities; but how can the soul directly know the modifications of a substance entirely distinct from itself? The modifications of matter are perceived by the soul only as it is in some way affected by them; that is, they are known, not directly, but indirectly through sensation. *This*, of course, sets aside the assumption that there can be no interaction between matter and mind. The soul perceives what kind of an object that must be which affects it in a certain manner, and the idea is the embodiment of the perception.

## CHAPTER XVII.

### THEORIES OF PERCEPTION CONTINUED.

**1. Locke** holds that there are two sources of knowledge—*sensation* and *reflection.* He says: "If it shall be demanded, then, when a man begins to have any ideas; I think the true answer is, When he first has any *sensation.* . . . . In time, the mind comes to reflect on its own operations about the ideas got by sensation, and thereby stores itself with a new set of ideas, which I call ideas of *reflection.* . . . . These simple ideas, the materials of all our knowledge, are suggested and furnished to the mind only by those two ways above mentioned, viz, *sensation* and *reflection.*" *Essay*, Book II., Chap. I., Sec. 23, 24, and Chap. II., Sec. 2.

Locke maintains that there are two classes of properties of matter—the *primary* and the *secondary.* He says: "Qualities thus considered in bodies are, first, such as are utterly inseparable from the body, in what state soever it be. . . . . These I call *original* or *primary* qualities of body, which I think we may observe to produce *simple ideas* in us; viz, solidity, extension, figure, motion or rest, and number. Secondly, such qualities which, in truth, are nothing in the objects themselves, but powers to produce various sensations in us, . . . as colors, sounds, tastes, etc., these I call secondary qualities. . . . . Ideas of primary qualities of bodies are resemblances of them, and their patterns do really exist in the bodies themselves; but the ideas produced in us by the secondary qualities have no resemblance of them at all. There

is nothing like our ideas existing in the bodies themselves." *Essay*, Book II., Chap. VIII., Sec. 9, 10, 15.

Locke also says: "It is evident that the mind knows not things immediately, but only by the intervention of the ideas it has of them. Our knowledge, therefore, is real, only so far as there is a conformity between our ideas and the reality of things." *Essay*, Book IV., Chap. IV., Sec. 3.

In regard to Locke, let it be observed that,

1st. We are not discussing his system in general, but only its bearing on the doctrine of perception.

2d. If the mind knows things only by the intervention of ideas, how does it know that its knowledge is valid, since it has no means of ascertaining whether there is or is not a conformity between our ideas and the reality of things? To ascertain this conformity, we must know the object without the intervention of the idea; but this would contradict the assumption that we know objects only by the intervention of ideas. The difficulty arises from regarding ideas as objective entities and objects of perception; but the difficulty vanishes, if we regard ideas as the final products of perception, representing the discoveries which we have made respecting the objects.

2d. According to Locke, we have no knowledge of secondary qualities of matter at all, for "our knowledge is real only so far as there is a conformity between our ideas and the reality of things; . . . the ideas produced in us by the secondary qualities have no resemblances of them at all." It is true that the secondary qualities are occult, and our ideas of them are vague, yet we *know* them as causes adequate to produce certain sensations.

3d. Locke ignored rational intuition, as a source of knowledge, and laid down principles in regard to perception, which prepared the way for the idealism and skepticism developed by Berkeley and Hume.

4th. Locke's method is metaphysical rather than psychological. It is true as Bowen says: "His question was not, What do we think and feel, and what are the laws governing the succession of our thoughts and feelings? — but, What do we know? Whence comes our knowledge? Is it born with us, or comes it from experience? What are the boundaries that limit it, and how far is it trustworthy?" Bowen's *Modern Philosophy*, page 13.

5th. Locke lays down the proposition, "All our knowledge comes through sensation and reflection," and then acts the part of an advocate in endeavoring to prove his proposition. If he had conducted his *Essay*, not as an advocate, but as an investigator, by examining the phenomena of mind revealed in consciousness, ascertaining their conditions and laws, and referring them to the faculties implied, he would, in all probability, have succeeded better. He was, however, a man of great intellect, and did great service to Philosophy, in exploding the doctrine of *innate ideas*. Locke's *Essay* is worthy of consideration and careful study.

**2. Berkeley** made important contributions to the doctrine of perception in his *New Theory of Vision*, published in 1709. Assuming with Descartes, Malebranch, and Locke, that *ideas* are the things immediately known, he denied not only that these ideas represented material objects, but the very existence of these objects. He says: "But, say you, though the ideas themselves do not exist without the mind, yet there may be things like them, whereof they are copies or resemblances, which things exist without the mind in an unthinking substance. I answer, an idea can be like nothing but an idea. . . . . Again, I ask whether these supposed original or external things, of which our ideas are the pictures, or representatives, be themselves perceivable or no. If they are, then they are ideas, and we have

gained our point; but if you say they are not, I appeal to any one whether it be sense to assert a color is like something which is invisible; hard or soft, like something which is intangible, and so on for the rest. . . . .

"I assert as well as you, that since we are affected from without, we must allow powers to be without, in a being distinct from ourselves. So far we are agreed. But then we differ as to the kind of this powerful being. I will have it to be spirit, you matter, or I know not what (I may add too, *you* know not what), third nature. Thus I prove it to be spirit: From the effects I see produced, I conclude there are actions; and because actions, volitions; and because there are volitions, there must be a will. Again, the things I perceive must have an existence, they or their archetypes, out of my mind; but being ideas, neither they nor their archetypes can exist otherwise than in an understanding. There is, therefore, an understanding. But Will and Understanding constitute, in the strictest sense, a Mind or Spirit."

Berkeley assumes that whatever is perceivable is an idea. But the idea, though an object of consciousness, is not the object of perception; it is the ideated inference which we have made concerning the object which causes our sensations.

The essential error of Berkeley's theory consists in the assumption that ideas are entities independent of the mental activity of the percipient subject, and hence that they are objects of perception. It is true that there *are* objective entities independent of the mind; but these are the objects which cause our sensations, and the corresponding ideas embody our knowledge of these objects. Our ideas of objects are therefore the constructions of the percipient mind representing its discoveries or conclusions, its knowledge or belief, concerning the cause of its sensations.

Berkeley's doctrine is the legitimate conclusion of the philosophy of Locke, as applied to the material world, and, as a *reductio ad absurdum* argument, is a refutation of that philosophy.

**3. Hume** began where Berkeley left off, and taking for his point of departure the current assumption of the prevailing philosophy, that all our knowledge is derived from sensation and reflection, deduced the following consequences:

1st. We have no warrant for inferring substance, whether matter as the substratum of the qualities perceived through sensation, or mind as the substratum of psychical phenomena experienced in consciousness.

2d. We have no warrant for inferring the reality of space and time save that they are abstractions from concrete experiences.

3d. We have no warrant for inferring the relation of cause and effect, in the sense that cause is efficient in producing the effect; hence, the relation called cause and effect is resolvable into that of antecedence and consequence.

We shall justify these statements by quotations:

Hume says: "An impression first strikes upon the senses, and makes us perceive heat or cold, thirst or hunger, pleasure or pain, of some kind or other. Of this impression there is a copy taken by the mind, which remains after the impression ceases, and this we call an idea. This idea of pleasure or pain, when it returns upon the soul, produces new impressions of desire or aversion, hope or fear, which may properly be called impressions of reflection, because derivable from it. These again are copied by the memory and imagination, and become ideas." *Treatise*, Book I., Part I., Sec. 2.

Again, Hume inquires, "whether the idea of *substance*

be derived from the impression of sensation or reflection. If it be perceived by the eyes, it must be a color; if by the ears, a sound; if by the palate, a taste, and so on for the other senses. But I believe none will assert that substance is either a color, a sound, or a taste. The idea of substance must, therefore, be derived from an impression of reflection, if it really exist. But the impressions of reflection resolve themselves into our passions and emotions, none of which can possibly represent a substance. We have, therefore, no idea of substance distinct from that of a collection of particular qualities, nor have we any other meaning when we either talk or reason concerning it. The idea of substance, as well as that of mode, is nothing but a collection of simple ideas that are united by the imagination, and have a particular name assigned them by which we are able to recall, either to ourselves or to others, that collection." *Treatise*, Book I., Part I., Sec. 6.

"Upon opening my eyes and turning them to the surrounding objects, I perceive many visible bodies; and upon shutting them again, and considering the distance betwixt these bodies, I acquire the idea of extension. . . . My senses convey to me only the impressions of colored points disposed in a certain manner. Hence, we may conclude with certainty that the idea of extension is nothing but a copy of these colored points, and the manner of their appearance. . . . .

"As it is from the disposition of the visible and tangible objects we receive the idea of space, so from the succession of ideas and impressions we form the idea of time; nor is it possible for time *alone* ever to make its appearance or to be taken notice of by the mind." *Treatise*, Book I., Part II., Sec. 3.

"As to those impressions which arise from the senses, their ultimate *cause* is, in my opinion, perfectly inexplic-

able by human reason, and it will always be impossible to decide with certainty, whether they arise immediately from the object, or are produced by the creative power of the mind, or are derived from the Author of our being." *Treatise*, Book I., Part IV., Sec. 2.

"The first time a man saw the communication of motion by impulse, as by the shock of two billiard balls, he could not pronounce that the one event was *connected*, but only that it was *conjoined*, with the other. After he has observed several instances of this nature, he then pronounces them to be *connected*. What alteration has happened to give rise to this new idea of connection? Nothing but that he now feels these events to be connected in his imagination, and can readily foretell the existence of the one from the appearance of the other. When we say, therefore, that one object is connected with another, we mean only that they have acquired a connection in thought, and gave rise to this inference, by which they are proofs of each other's existence. . . . . We may define a cause to be an object followed by another, and where all the objects similar to the first, are followed by objects similar to the second." *Inquiry*, Sec. 7, p. 2.

In regard to these statements of Hume, we remark:

1st. If all our ideas are derived from sensation and reflection, Hume ought to have concluded that we have no idea of matter as the substratum of external qualities, nor of mind as the substratum of psychical phenomena, nor of space and time, except as abstracted from sensation, nor of cause, except as a uniform antecedent. But we have all these ideas, as Hume well knew; hence, he drew the safer conclusion that we have no right to have them. Does Hume admit that we have these ideas? He speaks of *substance* as a *substratum*. What does he mean? He evidently had the idea of a substratum — an idea which he could not have,

if all our ideas are derived from sensation and reflection; hence, all our ideas are not derived from sensation and reflection.

2d. When Hume says: "As to those impressions which arise from the senses, their ultimate *cause* is, in my opinion, perfectly inexplicable by human reason," what does he mean by *cause?* It is quite clear that by *cause*, Hume here meant *efficiency* and not a *mere antecedent.* Again, he says: "An impression strikes upon the senses." An impression is the mark made on a receptive thing by some other thing, as the imprint made on paper by a seal. In the case of sensation, what is that other thing which *makes* the impression but the *cause* of the sensation? In saying that "an impression *strikes* upon the senses," and in speaking of the "ultimate cause" of impressions, Hume appears to have the idea of cause as *efficiency;* yet this idea he not only has no right to have, but could not have, if all our knowledge is derived from sensation and reflection; hence all our knowledge is not thus derived.

3d. If the cause is a *mere antecedent*, in no way affecting the consequent, it might as well be absent, since its presence or absence would be a matter of indifference; but when absent, the consequent does not follow; hence, the antecedent is not a *mere* antecedent, but something more—it is efficient in producing the consequent whenever the consequent is an event in the world of matter. Even in the case of motives and volitions, the motives are not mere antecedents; for they act efficiently on the intellect and the sensibility in producing cognitions and feelings, and are the *reasons*, though not the causes, of volitions. The will itself is the cause of volitions. It decides in view of motives.

4th. It may be true, as Hamilton believed, that Hume was not a dogmatist, but a skeptic; and that while hold-

ing his conclusions to be logical deductions from his premises, he may have believed neither his premises nor his conclusions. However this may be, Hume's conclusion is a *reductio ad absurdum* demonstration of the falsity of Locke's philosophy, more conclusive even than that of Berkeley.

5th. We hence see the importance of rational intuition in the development of philosophy. By rational intuition, the mind apprehends the impossibility of events without conditions, that is, it apprehends the necessity of conditions to the occurrence of events. A system of philosophy that fails to recognize fundamental truth is necessarily incoherent.

## CHAPTER XVIII.

### THEORIES OF PERCEPTION CONTINUED.

**1. Kant** opens the Critique of the Pure Reason by saying: "That all our knowledge begins with experience, there can be no doubt. . . . . But though all our knowledge begins with experience, it by no means follows that all arises out of experience." In the order of time, knowledge *a posteriori* precedes knowledge *a priori*.

The criteria which distinguish knowledge *a priori* from knowledge *a posteriori*, Kant lays down thus: "Now, in the first place, if we have a proposition which contains the idea of necessity in its very conception, it is a judgment *a priori;* if, moreover, it is not derived from any other proposition, unless from one equally involving the idea of necessity, it is absolutely *a priori*. Secondly, an empirical judgment never exhibits strict and absolute, but only assumed and comparative universality, by induction; therefore, the most we can say is, so far as we have hitherto observed, there is no exception to this or that rule." *Critique*, page 2, Bohn's Edition.

The distinction between the empirical and the rational elements of thought Kant applies in elucidating perception. Sensation is caused by objects affecting our sensibility. Through this sensation, we have an intuition of phenomenal objects. That in the phenomena which corresponds to the sensation, and is given to us, *a posteriori*, Kant calls the *matter;* but that which is necessary in order that the matter of the phenomena can be arranged under certain relations, and is given to us *a*

*priori*, and will remain, if we take away all empirical elements, he calls the *form*—pure as in space and time, impure as in substance and cause.

Kant considered the *a priori* elements of cognition to be subjective forms of thought, and not objective laws of things; and hence, notwithstanding their necessity, he held them to be phenomenal. This was his great mistake. The necessity of space and time is not only subjective, a necessity in the form of our thinking, but objective, a necessity in itself. Cause is not necessary, simply in the sense that we are compelled by the constitution of our minds to judge that every event must have a cause, but in the sense, that if there were no mind, it would still be true that an event could not take place without a cause.

His doctrine of perception, Kant thus sums up: "All our intuition is but the representation of phenomena; the things which we intuit are not in themselves the same as our representations of them in intuition, nor are their relations in themselves so constituted as they appear to us; and if we take away the subject, or even only the subjective constitution of our senses in general, then not only the nature and relations of objects in space and time, but even space and time themselves disappear; and as phenomena, can not exist in themselves, but only in us." *Critique*, page 35.

If we take away the subject, space and time would, of course, disappear, as to that subject, since then, by hypothesis, the subject would not be any thing to which they could appear. The ideas of space and time, as phenomena, can exist only in a subject; but space and time, as necessary realities in themselves, would continue to exist, though the subject were annihilated. It is true, that things are not the same as our representations of them; an object is one thing, and our representation of

it is another; but if things in themselves are wholly unknown, how did Kant know that their relations in themselves are not as they appear to us? It is true, we do not know the essential constitution of objects, as things in themselves, but the fact that the *a priori* elements are the same, whatever our sensations may be, proves that they are not vitiated by our sensations, and hence that they are the same to all rational minds.

2. **Reid** held that the thing perceived is not the image or idea, but the very thing itself. Our perception of external things is not, as Locke held, representative, but immediate and intuitive, and not, therefore, conjectural, but real.

We shall let Reid speak for himself: "If we attend to that act of our mind which we call perception of an external object of sense, we shall find in it three things: First, some conception or notion of the object perceived; secondly, a strong and irresistible conviction and belief of its present existence; and, thirdly, that this conviction and belief are *immediate*, and not the effect of reasoning." *Hamilton's Reid*, page 258.

Again, in reference to the conception of hardness, he says: "What shall we say, then, of this conception and this belief which are so unaccountable and untractable? I see nothing left but to conclude that, by an original principle of our constitution, a certain sensation of touch both suggests to the mind the conception of hardness and creates the belief of it; or, in other words, that this sensation is a sign of hardness." Page 121.

In regard to color, he says: "The common language of mankind shows evidently that we ought to distinguish between the color of a body which is conceived to be a fixed and permanent quality in the body, and the appearance of that color to the eye, which may be varied a thousand ways, by a variation of the light, of the

medium, or of the eye itself. The permanent color of the body is the cause which, by the mediation of various kinds or degrees of light, and of various transparent bodies interposed, produces all this variety of appearances. . . . .

The ideas of sight came to be associated with, and readily to suggest, things external and altogether unlike them. In particular, that idea which we have called the appearance of color, suggests the conception and belief of some unknown quality in the body which occasions the idea; and it is to this quality, and not to the idea, that we give the name of color." Page 137.

If the quality which Reid calls *color* is unknown, does the mind perceive the very thing itself? How does Reid know that his conceptions are true; in other words, that they correspond to the objects? This, according to his own admission, he does not know; for in the case of color, he admits that the external quality is unknown. Reid appears in this, to go back to the philosophy of Locke; but this is so only in appearance; for if all our ideas are derived through sensation and reflection, as held by Locke, we have no warrant for affirming an external reality back of the idea, and the skepticism of Berkeley and Hume are legitimate deductions. But Reid was saved from this result, by what he calls "common sense," which is only another name for *rational intuition.*

Reid ought not to have admitted that the quality called color is unknown; for it is known as the cause capable of giving us certain sensations. The quality which gives us a certain sensation through one sense, is associated with other qualities which are the attributes of the same substance, and these qualities give us other sensations through other senses.

In holding that perception is immediate, Reid means that the mind passes from the sensation to the concep-

tion of the quality, and the belief in its existence, not by the intervention of any reasoning process, but by an instinctive and irresistible principle of our constitution. Now, perception does not take place without sensation, and is, therefore, mediate through sensation; for the conception is suggested by the sensation; but from the sensation to the conception, it is, according to Reid, immediate. But even from the sensation to the conception, the passage is not immediate; for, between these there intervenes a judgment, perhaps several, derived from experience or investigation, and the conception is the idea embodying the conclusion.

**3. Hamilton** is not in perfect accord with Reid. He says: "Reid maintains that we are not conscious of matter; . . . . that we are conscious of our perception of a rose, but not of the rose perceived; that we know the ego by one act of knowledge, the non-ego by another. This doctrine I hold to be erroneous, and it is this doctrine I now proceed to refute.

"Reid is wrong, because 1°, the knowledge of opposites, is one. . . . . Thus, we can not know what tall is, without knowing what is short,—we know what virtue is, only as we know what is vice,—the science of health is but another name for the science of disease. The act which affirms that this particular phenomenon is a modification of Me, virtually affirms that the phenomenon is not a modification of any thing different from Me, aad consequently implies a common cognizance of self and not-self; the act which affirms that this other phenomenon is a modification of something different from Me, virtually affirms that the phenomenon is not a modification of Me, and consequently implies a common cognizance of not-self and self. But unless we are prepared to maintain that the faculty cognizant of self and not-self is different from the faculty cognizant of not-self and self, we must

allow that the ego and non-ego are known and discriminated in the same indivisible act of knowledge." *Bowen's Hamilton*, pages 150, 151.

The act in either case is complex, involving a plurality of elements. Thus, let there be some modification of the ego, as, for example, a feeling of pain. We are conscious of the pain, and refer it to the ego as its subject, whose conditional necessity we apprehend by rational intuition. We also refer the pain to its cause, whose conditional necessity is also apprehended by rational intuition, but whose specific qualities are inferred by an act of judgment, guided by the light of experience. The attention is, in this case, mainly attracted to the feeling of pain, and of this feeling consciousness takes special notice; but the mind is also aware, less vividly, of all the other acts involved, though not of the ego in its essence, nor of the cause in itself. In ordinary acts of perception, the attention is mainly directed to the object perceived.

Hamilton then inquires, "What, then, is the faculty of which this act is the energy? It can not be Reid's consciousness; for that is cognizant of the ego, or mind. It can not be Reid's perception; for that is cognizant only of the non-ego, or matter. But as the act can not be denied, so the faculty must be admitted." *Bowen's Hamilton*, page 151.

Reid did not hold that consciousness is cognizant of the ego, or mind, but only of the phenomena of the mind. Even Hamilton himself says: "There exists no intuitive or immediate knowledge of self as the absolute subject of thought, feeling, and desire; but, on the contrary, there is only possible a deduced, relative, and secondary knowledge of self, as the permanent basis of these transient modifications of which we are directly conscious." *Notes on Reid*, page 29, 5.

The fact is, consciousness is cognizant, not of the ego, but of the phenomena of the ego. The conditional necessity of the ego is apprehended by rational intuition, and its actuality is involved in its necessity. Perception is not an immediate knowledge of matter, but is mediate, through sensation.

Hamilton asks: "By what faculty are the ego and the non-ego discriminated?" Page 151. The mind itself knows and discrimates. Its ability to know is a faculty; and its ability to know in a special way is a special faculty. The faculty does not know, but it is the ability of the mind to know. The mind has the ability to know the non-ego; it has also the ability to know the necessity, and hence the actuality of the ego. The same mind knows both the non-ego and the actuality of the ego. It has the ability to know these two acts of knowledge, and is actually conscious of these acts, and by reflection discriminates between them. But in discriminating between the acts of knowledge, the mind is able to discriminate between the two objects of knowledge; for it discovers that the difference between the acts is determined by the difference between the objects, since the subject is the same. It is not necessary that the mind should know two objects by the same faculty, in order to be able to discriminate between them. The very fact that it must know them by different faculties is a means of discrimination, as in knowing color and sound.

Again, Hamilton says: "Because 2°, he thus contradicts his own doctrine of an immediate knowledge of an external world," page 153. Reid's opinions in regard to our knowledge of an external world were neither clear nor consistent. It is evident that there is no immediate knowledge of the external world; for did not the external world in some way affect us, we would not be aware of its existence. We know it as the cause of sen-

sation. In general, we may say that whatever does not in some way affect us, must be to us as zero, unless we know it by rational intuition, as the necessary condition, or by logical inference, as the necessary consequence, of some something which does affect us.

Hamilton further says: "An act of knowledge existing and being what it is, only by relation to its object, it is manifest that the act can be known only through the object to which it is correlative; and Reid's supposition that an operation can be known in consciousness to the exclusion of its object, is impossible. For example, I see the inkstand. How can I be conscious that my present modification exists,—that it is a perception, and not another mental state,—that it is a perception of sight to the exclusion of every other sense,—and, finally, that it is a perception of the inkstand, and of the inkstand only,—unless my consciousness comprehends within its sphere the object, which at once determines the existence of the act, qualifies its kind, and distinguishes its individuality? Annihilate the inkstand, you annihilate the perception; annihilate the consciousness of the object, you annihilate the consciousness of the operation." Page 153.

It is true that if you annihilate the inkstand, you annihilate the perception; but it is not true that if you annihilate the consciousness of the object, you annihilate the consciousness of the operation. Hamilton holds that, when we see an inkstand, we are conscious, not only of the perception, but of the inkstand. But we shall let him refute himself.

"What is the external object perceived? . . . . Nothing can be conceived more ridiculous than the opinion of philosophers in regard to this. For example, it has been curiously held (and Reid is no exception), that in looking at the sun, moon, or any other object of sight,

we are, on the one doctrine, actually conscious of these distant objects; or, on the other, that these distant objects are those really represented in the mind. Nothing can be more absurd; we perceive through no sense aught external but what is in immediate relation and immediate contact with its organ."- Page 352.

Then, we do not even perceive the inkstand on the desk, unless it is brought into contact with some organ of sense. But Hamilton has already said that if we see it, we perceive it, and are conscious, not only of the perception, but of the inkstand itself. We are, then, according to Hamilton, both conscious and not conscious of the inkstand at the same time, which is absurd.

We are not conscious of the object, even when it is in contact with the organ. Neither are we conscious of the organ affected, nor of the affection, but of the sensation accompanying the affection. By intuition, we know that this sensation has a cause, but not what the cause is. It is only by an inferential judgment, guided by the light of experience, and spontaneous from habit, that we determine what the cause is, and this determination varies in degree of probability between the limits of ignorance and certainty. The judgment is embodied in the idea of the object.

"Why do mankind believe in the existence of an outer world? They do not believe in it as in something unknown; but, on the contrary, they believe it to exist, only because they believe that they immediately know it to exist. The former belief is, only as it is founded on the latter. Of all absurdities, therefore, the greatest is to assert,—on the one hand, that consciousness deceives us in the belief that we know any material object to exist, and on the other, that the material object exists, because, though on false grounds, we believe it to exist." Page 189.

What we are immediately conscious of in perception is not the material object itself, but the act of perception, and the product, which is the idea or appearance embodying our knowledge or judgment concerning the object.

Now, of this appearance, as a mental product, we are conscious, and if we mistake this appearance for the object, or thing itself, as many do, we shall, of course, seem to be conscious of the object. But the appearance is not the object; for if we had the same sensation, from whatever cause, as the inkstand gives, we should seem to see the inkstand, and to be conscious of the appearance, though no inkstand were there, or perhaps any other material object. Are we, in this case, conscious of the material object? In looking into a mirror, we see an image of ourself behind the glass. Is that image ourself? Are we behind the glass? We seem to see other objects behind the glass, which are, in reality, before it. These appearances are mental constructions embodying our conclusions respecting the objects. We are conscious of these appearances, but not of the objects themselves. It is by confounding these appearances with the objects, that we are led to believe that we are conscious of the objects. In denying, then, that we are conscious of the external material objects, we do not deny the testimony of consciousness; for consciousness gives no such testimony, when we discriminate between the appearance and the object, which we must do, when looking in a mirror, and ought to do in all other cases. Hamilton's statement, therefore, that if we are not conscious of material objects, consciousness gives a false testimony, is void of force. We have falsified no fact of consciousness, and may still hold with Hamilton himself the sound principle,—"the falsity of one fact of consciousness being admitted, the truth of no other fact of consciousness can be maintained." Page 191.

## CHAPTER XIX.

### THEORIES OF PERCEPTION CONCLUDED.

**1. John Stuart Mill** assumes certain sensations, as states of consciousness, with their temporal relations of co-existence or sequence, and by means of the laws of association, attempts to account for our belief in the existence of an external world.

In his theory of *space*, Mill attempts to account for the origin of our idea of space as follows: "Suppose two small bodies, *A* and *B*, sufficiently near together to admit of their being touched simultaneously, one with the right hand, the other with the left. Here are two tactual sensations which are simultaneous, just as a sensation of color and one of odor might be; and this makes us cognize the two objects of touch as both existing at once. The question then is, what have we in our *minds* when we represent to ourselves the relation between these two objects already known to be simultaneous, *in* the form of extension, or intervening space — a relation which we do not suppose to exist between the color and the odor?

"Now, those who agree with Brown, say that whatever the notion of extension may be, we acquire it by passing our hand, or some other organ of touch, in a longitudinal direction from *A* to *B;* that this process, as far as we are conscious of it, consists of a series of varied muscular sensations, differing according to the amount of muscular effort; and the effort being given, differing in length of time. When we say that there is a space

between *A* and *B*, we mean that some amount of these muscular sensations must intervene; and when we say that the space is greater or less, we mean that the series of sensations (amount of muscular effort being given) is longer or shorter.

"If another object *C* is farther off in the same line, we judge its distance to be greater, because, to reach it, the series of muscular sensations must be further prolonged, or else there must be the increase of effort which corresponds to augmented velocity. Now, this, which is unquestionably the mode in which we become *aware* of extension, is considered by the psychologists in question, to *be* extension. . . . .

"An intervening series of muscular sensations before the one object can be reached from the other, is the only peculiarity which (according to this theory) distinguishes simultaneity in space from the simultaneity which may exist between a taste and a color, or a taste and a smell; and we have no reason for believing that space or extension in itself, is any thing different from that which we recognize it by. It appears to me that this doctrine is sound, and that the muscular sensations in question are the sources of all the notions of extension which we should ever obtain from the tactual and muscular senses without the assistance of the eye." *Exam. of Hamilton*, Vol. I., page 280.

In reply, let us begin with the statement, "We have no reason for believing that space or extension, in itself, is any thing different from that which we recognize it by." Now, even granting that Mill is right in his opinion in regard to the means by which we recognize space, it by no means follows that we are to identify the object recognized with the means of recognition. There is a great gulf here between the premise and the conclusion. We might as well identify a person, recog-

nized by his voice, with his voice by which we recognized him.

In the very terms of his illustration, Mill pre-supposes the idea of space developed; he assumes "Two small bodies, *A* and *B*, sufficiently near together to admit of their being touched, one with the right hand, the other with the left." Each of these bodies, however small, being large enough to excite the sensation of touch, occupies space, or is extended.

Again, these bodies being "sufficiently near together," are located, and each has a location distinct from that of the other, otherwise they could not be discriminated as two; for the two sensations caused by the two bodies, being similar in quality and quantity, and simultaneous in time, would blend into one, and could not be discriminated, unless located as reciprocally external. The locations of the bodies being distinct, the bodies themselves being reciprocally external, there is not only the space occupied by the bodies, but space between them; hence, we reach the idea of space without the muscular sensation, and before we have the sensation by which, according to Mill, "we become aware of extension," and which Mill considers even "to *be* extension."

The two bodies, "*A* and *B*," must, according to Mill, be regarded as two sensations, since the idea of space is supposed to be not yet developed, and must be assumed, not as bodies in space, but as sensations in time.

We must also throw out the idea of the movement of the hand from *A* to *B*, for motion implies space. We then have left, simply the sensation *A*, followed by certain other sensations, then the sensation *B*. Now, in this, we have a succession of sensations in time, but not the idea of space. Hence, a succession of muscular sensations can not be the mode by which we become aware of extension, much less is it identical with extension, as

Mill absurdly teaches. Surely the philosopher who confounds space with muscular sensation is not a reliable guide.

The sensations in the two hands, though simultaneous and alike in kind and degree, are actually discriminated; but rational intuition apprehends, as the condition of this discrimination, the necessity of the reciprocal externality of the two sensations; for if not reciprocally external, they would blend into one, and hence could not be distinguished as two. The mind intuitively apprehends that space must be, in order that the discrimination of simultaneous sensations, alike in kind and degree, may be; and since such discrimination is a fact, space must be a reality.

The extent of space between *A* and *B*, the idea of space being already developed, may indeed be estimated by the muscular effort required in passing the hand from *A* to *B*, though the reality of this space is determined by the cognition of the sensations as distinct in the two hands, which is impossible, save on the condition of the reciprocal externality of these sensations. The idea of locality, though at first vaguely apprehended, as implicitly involved in the idea of the reciprocal externality of two sensations, becomes clear in proportion as experience is enlarged.

Let us now examine Mill's explanation of the belief in the existence of a material world. He maintains "that there are associations naturally and even necessarily generated by the order of our sensations and of our reminiscences of sensation, which, supposing no intuition of an external world to have existed in consciousness, would inevitably generate the belief, and would cause it to be regarded as an intuition.

"What is it we mean when we say that the object we perceive is external to us, and not a part of our thoughts?

We mean that there is in our perception something which exists when we are not thinking of it; which existed before we had ever thought of it, and would exist if we were annihilated; and further, that there exist things which we never saw, touched, or otherwise perceived, and things which have never been perceived by man. . .

"The conception I form of the world existing at any moment, comprises along with the sensation I am feeling, a countless variety of possibilities of sensation. . . . These various possibilities are the important things to me in the world. My present sensations are generally of little importance, and are moreover fugitive; the possibilities, on the contrary, are permanent, which is the character that mainly distinguishes our idea of substance or matter from our idea of sensation.

"These possibilities, which are conditional certainties, need a special name to distinguish them from mere vague possibilities which experience gives no warrant for reckoning upon. Now, as soon as a distinguishing name is given, though it be only the same thing regarded in a different aspect, one of the most familiar experiences of our mental nature teaches us, that the different name comes to be considered as the name of a different thing.

"There is another important peculiarity of these certified or guaranteed possibilities of sensation; namely, that they have reference, not to single sensations, but to sensations joined in groups. When we think of any thing as a material substance, or body, we either have had, or think that, on some given supposition, we should have, not some one sensation, but a great and even an indefinite number and variety of sensations, generally belonging to different senses, but so linked together that the presence of one announces the possible presence, at the very same instant, of any or all of the rest. . . . .

"The group, as a whole, presents itself to the mind

as permanent, in contrast, not solely with the temporariness of my bodily presence, but also with the temporary character of each of the sensations comprising the group; in other words, as a kind of permanent substratum under a set of passing experiences or manifestations; which is another leading character of our idea of substance or matter as distinguished from sensation. . . . .

"In addition to fixed groups, we also recognize a fixed order in our sensations; an order of succession, which, when ascertained by observation, gives rise to the ideas of cause and effect, according to what I hold to be the true theory of that relation, and is, in any case, the source of all our knowledge of what causes produce what effects. Now, of what nature is this fixed order among our sensations? It is a constancy of antecedence and sequence. . . . .

"In almost all the constant sequences which occur in Nature, the antecedence and consequence do not obtain between sensations, but between the groups we have been speaking about, of which a very small portion is actual sensation, the greater part being permanent possibilities of sensation, evidenced to us by a small and variable number of sensations actually present. Hence, our ideas of causation, power, activity, do not become connected in thought with our sensations as actual at all, save in the few physiological cases when these figure by themselves as the antecedents in some uniform sequence. These ideas become connected, not with sensations, but with groups of possibilities of sensation. . . . .

"We find that the modifications which are taking place, more or less regularly, in our possibilities of sensation, are mostly quite independent of our consciousness, and of our presence or absence. Whether we are asleep or awake, the fire goes out, and puts an end to one particular possibility of warmth and light. Whether

we are present or absent, the corn ripens and brings a new possibility of food. Hence, we speedily learn to think of Nature as made up solely of these groups of possibilities, and the active force in Nature as manifested in the modification of some of these by others.

"The sensations, though the original foundation of the whole, come to be looked upon as a sort of accident depending on us, and the possibilities as much more real than the actual sensations, nay, as the very realities of which these are only the representations, appearances, or effects. When this state of mind has been arrived at, then, and from that time forward, we are never conscious of a present sensation without instantly referring it to some one of the groups of possibilities into which a sensation of that particular description enters; and if we do not yet know to what group to refer it, we at least feel an irresistible conviction that it must belong to some group or other; that is, that its presence proves the existence, here and now, of a great number and variety of possibilities of sensation, without which it would not have been.

"The whole set of sensations, as possible, form a permanent back-ground to any one or more of them that are, at a given moment, actual; and the possibilities are conceived as standing to the actual sensations in the relation of a cause to its effects, or of canvas to the figures painted on it, or of a root to the trunk, leaves, and flowers, or of a substratum to that which is spread over it, or in transcendental language, of matter to form." *Examination*, Volume I., page 236, *et seq.*

Let us not be deceived by the plausible ingenuity of Mill's theory, or by his apparent belief in the independent existence of matter. This independent existence is, after all, according to Mill, only the permanent possibility of sensation. This would be well enough, if this

permanent possibility were objective; but according to his view, this permanent possibility is subjective; for he holds that the sensations are the original foundations of the whole. The associations generated by the groups of sensations and the order of their sequence induce in us the belief in a material world. What does Mill mean by the active force of Nature? Neither a simple sensation nor a group of sensations is force. Sensation and force are not identical.

Mill conceives the possibilities of sensations as standing to the actual sensations in the relation of causes to their effects. If by possibilities of sensations are meant the objective realities independent of us, we would yield assent; for these might indeed cause sensations in us; but this can not be the meaning, since Mill holds that sensation is the original foundation of the whole. Sensations occurring in groups with a certain order of sequence, are, according to Mill, the only realities, and the possibilities of these sensations are the causes of those which actually occur. Associated with the color of an apple are a number of possible sensations of smell, taste, touch, etc. Is the possibility of these sensations the cause of color? Not unless by the possibility, we mean the independent, objective existence of the substance of the apple. The cause of the sensation of color, or of any other special sensation experienced by us, is not the subjective possibility of other sensations.

The fact that sensations often come to us unsought, and that when the conditions are complied with, they are beyond our control, compel us to refer them to objective substances. These substances are powers, not phenomena, and consequently are not known to consciousness, yet their conditional necessity is apprehended by rational intuition. They are the forces which manifest the qualities causing sensation.

**2. Dr. Porter** says: "Objectively viewed, perception always knows a material non-ego. But the objects of simple and complex perception are unlike. In *simple* or *original* perception, the object is a simple percept—*i. e.*, an extended non-ego. But the term *non-ego* is equivocal, being capable of three distinct meanings, corresponding to the three distinguishable *egos* with which they are contrasted. These are the following: (1) The perceiving agent as a pure spirit; (2) the percipient agent as a spirit animating an extended sensorium; (3) the individual as spirit, sensorium, and body.

"The three *non-egos* contrasted with these are: (1) The sensorium in excited action, distinguished by the soul from itself as pure spirit; (2) the body perceived as other than the sentient soul—*i. e.*, the soul as animating the sensorium; and (3) the surrounding universe, as distinguished from the soul, sensorium, and body—*i. e.*, from the man as soul and body united.

"In original perception, the object directly apprehended is the sensorium as excited to some definite action. This is distinguished from the soul as percipient, by the soul's own act of discrimination. In other words, the *ego* and *non-ego* contrasted are the first named above. This *non-ego* is the percept appropriate to each of the sense organs." *Elements*, page 188.

Let us now see how Dr. Porter explains the perception of external material things: "A material thing or object, as known by sense-perception, is a completed whole made up of separate percepts." Page 165. But, according to the above, "the sensorium as excited to some definite action," is "the percept appropriate to each of the sense organs," then a material thing, as an apple, as known by sense-perception, "is a completed whole made up of separate percepts;" that is, an apple is a completed whole made up of the sensorium excited

through the eye, the sensorium excited through the ear, etc., through all the senses! But what excites the sensorium?

According to Dr. Porter's theory, we can never reach a knowledge of a world external to the sensorium, even by acquired perception. For he says: "An acquired perception is gained by using the knowledge given directly by one sense, as the sign or evidence of the knowledge which we might gain by another." Page 132. But the knowledge which we might gain by another sense, if actually gained by that sense, would, according to Dr. Porter's view, be only a knowledge of the sensorium excited through that other sense organ, but if not actually gained, is only the conception of the sensorium excited through that other sense organ, so that if the original and acquired perceptions united give us material things, these material things, as known by sense-perception, original and acquired, are nothing more than the sensorium actually excited through certain sense organs, together with the conception of how the sensorium might be excited through other sense organs.

Dr. Porter thinks that the immediate object of consciousness is the sensorium excited to some form of definite action. He says: "But what! it may be asked, when I grasp a pebble, or an ivory ball, or a stick, is that which I perceive as external to myself, simply the sensorium excited by the object grasped? Is this the *non-ego* which I perceive, and this only? We reply, that this is the only *non-ego* which we reach by direct and original perception." Page 124.

Dr. Porter holds that the object of immediate perception is "the sensorium in some form of excited action," page 106; that the sensorium consists of "the nervous organism and the sense organs," page 187; that "the soul is not aware that it has nerves at all, or that one or

more are called into action." Page 121. How, then, can the object of immediate perception be the sensorium in some form of definite action?

A sensation located in the sensorium is an object of consciousness; but the sensorium itself is known immediately only as the locus of sensation. Without the guidance of rational intuition, we are shut up to a knowledge of subject experiences.

The processes involved in perception are as follows: An object excites an organ of sense; this excitement, conveyed by the nerves to the higher centers or brain, is followed by a sensation; rational intuition affirms that this sensation has a cause; the judgment, guided by experience, infers what this cause is; the imagination embodies this inference in an idea which represents our knowledge of the qualtity in the object which excited the organ of sense. Other qualities of the object may excite other organs of sense, and, by similar processes, we form ideas of these qualities. The combination of these ideas is the complex idea which represents our knowledge of the object.

But do we know the object as it is in itself? We press our hand upon a block of wood, for example, and pronounce it hard, by which we mean that the *parts* are held firmly in their relative positions. Is not this true of the object in itself? Again, we look at it, and handle it, and, pronounce it a cube, and by this we mean that the object is bounded by six equal squares, and has eight corners and twelve edges. Is this not true of the object in itself? But if we attempt to find out the essence of the body, the secret of its constitution, the nature of the underlying forces, we shall find that we have undertaken to solve a problem which transcends our powers.

# DIVISION II.

## REPRESENTATION AND THE REPRESENTATIVE FACULTIES.

## CHAPTER I.

### GENERAL VIEW OF REPRESENTATION.

**1. Representation defined as an act, as a product, and as a faculty.**

1st. The *act* of representation is the process by which the intellect reproduces its acquisitions. It is, therefore, *re-presentation.*

2d. The *product* of representation is the *idea* or *representative object* constructed by the act of representation. As a psychical object, it is called an *idea*, an *image*, or a *phantasm.* The object represented by the idea is a past idea of either a material or a psychical object.

3d. The *faculty* of representation is the power of the intellect to represent its acquisitions.

**2. Illustrations.**—Look, for example, upon a landscape, and perceive it, as a whole, with all its various objects in their respective positions. Close the eyes and represent the landscape to the mind.

We also recall the acquisitions made through the other senses. Thus, in idea, we recall the odor of a rose, the flavor of a peach, the softness of velvet, or the familiar voice of a friend.

**3. Comparison of perception and representation.**—In perception, the intellect determines, from the nature of

the given sensations, the nature of the objective causes which excite these sensations, and constructs the appearances so as to embody its conclusions. Hence, if the sensations are definite, also the inferences, then the constructions, or ideated inferences, are clear and distinct, and correspond to the realities of things.

In representation, the intellect, in the absence of sensations excited by external causes, represents its acquisitions, and varies its constructions at pleasure.

In perception, the appearance of an object is more than the group of sensations which that object causes in us through the several senses; it is rather a complex idea of the object, and embodies our judgments of those qualities of the object which cause certain sensations in us. The sensations occur in groups, since the causes of these sensations are united as the manifestations of the qualities of a common substance.

In representation, the idea of an object is complex, and the elements of the idea are the ideas of the qualities which are the causes of the several sensations.

As objects are perceived in their relations to space and time and to one another, so they are represented with like relations. A relation, as such, apart from the objects related, is not an object either of perception or of representation.

Ideas as representative of experiences in consciousness, or of appearances through perception, are individual, and as such are constructed by the representative faculty. In this respect, they differ greatly from the generalized concepts of the logical faculty, which are not capable of representation.

**4. Classes of representation.**— Representation is classified as memory, imagination, and phantasy. In *memory*, the representations correspond to past realities as formerly known. In *imagination*, the images are the ideals of

the true, the beautiful, and the good, or of their opposites. In *phantasy*, the images are grotesque appearances corresponding neither to past realities nor to subjective ideals.

**5. Theories of representation.** — As actual, as a fact to which consciousness testifies, representation must be possible. It is one thing, however, to ascertain a fact, but quite another thing to account for that fact. How is representation possible? On what conditions does the representation of acquisitions depend, when made long ago, and are now, perhaps, forgotten? How is the knowledge of an object revived in the absence of that object? The conditions of representation being beyond the sphere of consciousness, can not be positively determined. The solution of the problem is, therefore, hypothetical. Two hypotheses have been proposed to account for the fact of representation.

1st. *Mental latency or unconscious mental action.* If this hypothesis be true, the latent modifications, or unconscious activities, are not phenomena; that is, they do not appear, otherwise we should be conscious of them. The attention directed to the more prominent activities, is withdrawn from those obscure processes occurring in the profound depths of the soul, which are, therefore, unknown to consciousness.

It is doubtless true that, in some instances, there is a consciousness of certain obscure activities at the moment of their occurrence, yet, on account of their unobstrusiveness, they attract but slight attention, and are instantly forgotten. Examples of this kind, such as forgetting that we heard the clock strike, or a bell ring, will occur to the reflective mind.

2d. *Unconscious cerebration.* It has already been seen that sensation excited by an external object, is the condition of the perception of that object. The sensation

caused by one object may, however, be the occasion of the representation of another object. If it be assumed that, in the absence of the external object, the sensation is revived by some molecular movement in the brain or other portion of the nervous system, we have an explanation of the fact of representation. According to this view, perception is occasioned by the stimulus of sensation excited by an extra-organic object; and representation is occasioned by the sensation excited by some change in the nervous system, occasioned in some other way than by the action of the object represented.

It is probable that certain mental processes are so unobtrusive that they either escape notice altogether, or the attention given them is so slight that they are instantly forgotten. The fact that representations are variable, at will, indicates that they are not altogether determined by sensations excited either by external causes or by molecular changes. This is, of course, in favor of the first theory. On the other hand, certain representations, as phantoms, are determined and forced upon the mind with the same necessity as the appearances in perception, and hence indicate that they are formed under the stimulus of sensations excited by molecular changes occasioned, in certain instances, at least, by alcoholic or narcotic stimulants. This favors the second theory. The probability is, therefore, that the one theory is true in certain cases and the other theory in other cases.

**6. Nature of the product.** — The nature of the product, as a representative object, will be more clearly understood by a consideration of its characteristics.

1st. The idea is a *psychical* object. Whether the object represented be material or spiritual, the idea, image, or phantasm, is a psychical object, created by the representative faculty in the act of representation.

2d. The idea is an *evanescent* object. The representative object, unlike the object whose appearance is represented, is transient, since it continues in existence no longer than it is kept in being by the act of the representative faculty.

3d. The idea is an *intellectual* object. Whatever the object represented may be,—whether material, as mountains, lakes, clouds, trees, living beings; or psychical, as cognitions, feelings, volitions,—the idea is not only psychical, but intellectual, since it is created by the intellect and for the intellect, though feeling, as of pleasure or of sadness, may accompany the representation.

4th. The idea is a *representative* object. An idea can not resemble a material object; but one idea may resemble another; and hence, as in memory, it may represent the original appearance constructed by the intellect in the act of perception under the stimulus of sensation. In imagination or phantasy, the images or phantoms do not represent appearances of real objects, as in memory, but of unreal objects, whether possible or impossible.

5th. The idea is *less vivid* than the original appearance. This can be verified by looking at an object, then closing the eyes, and representing that object. The idea is usually found to be a faint reproduction of the original appearance. The same thing is found true by hearing music, and then representing it.

6th. The idea contains *fewer elements* than the original appearance. A comparison of the idea with the original appearance reveals the fact that the former is but a meager outline of the latter.

7th. The elements of the idea are recalled *in succession.* In perception, the elements of the original appearance flash at once on the mind in rich profusion; but in representation, these elements are revived in succession,

one suggesting another. This distinction is vividly brought out by Dr. Porter:

"It is a precipice up which we gaze. First, it impresses us as a whole diversified by its varied features. Foremost are the broad faces of perpendicular or impending rock. These are buttressed by slopes strewn with accumulated fragments. Here and there are bushy crags and scattered bowlders. The whole cuts againts the sky with a notched outline fringed here and there with nodding herbage, or broken by some daring tree that, stayed upon its uncertain footing, reaches out and up toward heaven. . . . . The quick eye first surveys the whole with a rapid sweep, then runs hither and thither, as it is caught and led by some salient feature, the rock itself bringing out new material faster than the mind can appropriate it, impressing the feelings with new emotions of wonder the longer we strive to master its wealth.

"Let us seek to image that rock in the mind, at evening, when we are just returned from a fresh gaze upon its front. In place of the exhaustless confusion of the vaguely-seen whole to guide and excite the eye, there is slowly revived the scanty frame-work of the few parts which can be recalled by the mind. These parts are recovered, one by one, as the mind, resting upon what is already present, brings back in fragments, and by repeated efforts, that which each present object suggests. However exciting the effort to recall and reconstruct, and however pleasing the picture that is recalled, the impressiveness and exciting power of the reality are wholly wanting." *Elements*, page 220.

**7. Utility of representation.**—The *utility* of representation will be apparent from the following considerations:

1st. Representation is a source of *pleasure* and *relief*. It affords pleasures, pure and varied, and independent

of fortune or circumstances. The pleasures may be enjoyed by the child at his play, by the laborer at his toil, by the artist in his creations, by the sick man on his bed, by the philanthropist in his labor of love, or by the prisoner in his gloomy dungeon.

2d. Representation is the condition of the *logical processes.* In thought, we often prefer the representation to the real object; since, containing fewer elements, it is less distracting. The imagination can, at will, so vary the image as to include the elements under consideration and exclude all others. It thus renders great aid in classification and induction. The image of an individual is variable, and by dropping the peculiarities of the individual, the image becomes a *schema* which, in turn, may, by the addition of other peculiarities, be varied so as to be conformable to any individual of the class.

3d. The idea is useful, even in *observation*, since it directs the mind to seek for elements which it might otherwise overlook.

4th. Representation is useful in *preparing for action.* A vivid imagination is effective in adjusting the powers of the mind or the body for energetic effort. Imaginary conflicts prepare for real. Raw recruits are trained, if possible, before they are led to an engagement.

5th. Representation furnishes *ideals* for real life. Pure ideals elevate our aspirations and lead to noble deeds or to high intellectual or moral achievements. They aid the soul in triumphing over evil in the spiritual struggles of a religious life. The imagination may also lend itself to evil and create those images which allure the soul into paths of sin and death.

## CHAPTER II.

### LAWS OF REPRESENTATION.

**The laws** of representation, called also the laws of association, may be divided into two classes—general or primary, and special or secondary.

**1. The general or primary** laws are those which are universal in their application. These laws, as usually stated, are the following:

1st. *The law of co-existence or consecution in time.* One thing suggests another connected with it as simultaneous or immediately antecedent or consequent.

2d. *The law of contiguity in space.* Either of two things known to be contiguous in space, when perceived or recalled, suggests the other. As things contiguous in space are usually perceived simultaneously or in immediate succession, this law acts in connection with the first, or perhaps is resolvable into it.

3d. *The law of dependence.* The condition suggests the conditioned, or the conditioned the condition; a cause its effect, or an effect its cause; the means the end, or the end the means; the premises the conclusion, or the conclusion the premises; the whole a part, or a part the whole, etc.

4th. *The law of resemblance or contrast.* Either of two similar things suggests the other, and, in like manner, either of two things in striking contrast. Thus, one large man suggests another large man, or a small man another small man. Thus, also, summer suggests winter, and winter summer; cold heat, and heat cold; darkness

light, and light darkness; the rich the poor, and the poor the rich; the young the old, and the old the young; the giant the dwarf, and the dwarf the giant; the true the false, and the false the true; the beautiful the ugly, and the ugly the beautiful; the good the bad, and the bad the good; the finite the infinite, and the infinite the finite, etc.

5th. *The law of mutual relation.* Things known to be related to the same thing suggest one another. Thus, either of two effects of the same cause suggests the other, or either of two possible causes of the same effects, or either of two signs of the same thing, etc.

6th. *The law of sign and signification.* Thus, mathematical signs suggest certain operations, and the operations the signs; words ideas, and ideas words; symptoms the disease, and the disease the symptoms, etc. This law also accounts for the fact that objects denoted by the same sound suggest one another, which is usually stated as another law. For, one object suggests the sound which is its sign, according to the law of sign and signification, and this sound suggests the other object which it denotes, according to the same law.

Attempts *to reduce* the number of laws have been made as follows:

1st. *Aristotle* enumerated the laws, as *contiguity in time or place*, *resemblance*, and *contrast*. These laws hold good as far as they go, but the list is not complete.

2d. *Hume* stated the laws, as *resemblance*, *contiguity*, *cause* and *effect*. These are true, but not complete. Hume omits *contrast*, of Aristotle's classification, and adds *cause* and *effect*. In other respects there is an agreement.

3d. *Hamilton* reduced the laws to two—*simultaneity* and *affinity*. Here we have a higher, and perhaps a comprehensive generalization. Simultaneity in time, in

things known, comprehends contiguity in space, and is a valid law. Affinity includes the resembling or analogous, or partially identical objects, also contrariety, as the knowledge of opposites is one, since we can know what light is only in contrast with darkness, or health only in contrast with sickness, etc.

4th. *Bain* also reduced the laws to two—*contiguity* and *similarity*. These are nearly identical with Hamilton's. Contiguity primarily refers to space, but may apply to time. Similarity is analogous to affinity, yet does not include contrast, but expressly excludes it. Mr. Bain states the law of contiguity thus: "Actions, sensations, and states of feeling, occurring together or in close succession, tend to grow together, or cohere, in such a way that, when any one of them is afterwards presented to the mind, the others are apt to be brought up in idea." *Senses and Intellect*, page 327. That is, ideas cohere, as if they attracted one another, or they stick together, as if covered with mucilage!

5th. *The law of correlation.* Either of two things, known to be correlated, suggests the other. The laws, as usually stated, or the more general laws of Aristotle, Hume, Hamilton, and Bain, may be reduced to this one, which is a higher generalization, and a more concise statement.

6th. *St. Augustine* reduced the laws to one, called the law of *redintegration*, which may be stated thus: Objects that have been previously united as parts of a single mental state suggest one another. Hamilton himself showed that his two laws of simultaneity and affinity could be reduced to the one law of redintegration. This law is also accepted by Wolfe, Malebranch, and Maass.

The law of redintegration affirms the restoration of the whole of a mental state or process on the condition of the presence of any of the parts. Let us ascertain

whether this law comprehends the laws as commonly stated:

(1) Things simultaneous or consecutive in time suggest one another, when they have been considered together in the same process of thought, since the recurrence of a part of this process suggests the other part.

(2) Things contiguous in space recall one another, if they have been thought of together, since one part of a process of thought recalls the other.

(3) Dependent or related things also recall one another, if the dependence or relation is known, or if they have been thought of together.

(4) Resembling or contrasted things suggest one another, even if they have never been thought of together. The law of redintegration does not literally apply here; but if we consider similar things to be essentially the same, and the knowledge of opposites as one, the law of redintegration will include that of resemblance and contrast. Thus, suppose we know that $A$ is composed of $l$ and $m$, and $B$ of $m$ and $n$. Now, in considering $A$, the mind either finds $m$ directly, or $l$, which suggests $m$; and this $m$ in $A$, being similar to $m$ in $B$, may be considered essentially the same and be taken for it, or if you please, mistaken for it; but $m$ in $B$ has been thought of with $n$, and hence suggests $n$; but $m$ and $n$ combined give $m\ n$, that is $B$. Sir Philip Sidney suggests Queen Elizabeth, or the reverse, since each wore a ruff about the neck. Either of these persons suggests the ruff; and the ruff, the other person.

In case of contrast, let $A$ be $lm$, and $Z$ be $pq$, $l$ and $q$ being antithetical. The cognition of $l$ involves that of $q$, since the knowledge of opposites is one; but $q$ suggests $p$, since they have been thought of together, and $p$ combined with $q$ gives $pq$, that is $Z$.

But the fatal objection to the law of redintegration is

the fact, as stated by Dr. Porter, that "Objects or ideas have of themselves no greater force or tendency to restore those which with themselves made up a mental state, than they have to attract one another. The force, in the final analysis, must come from and reside in the mind whose products they are. . . . . The mind thinks or tends to think of *a* when it perceives or thinks of *b*, because it has previously acted in a similar activity, in whole or in part." *Elements*, page 236.

7th. *Dr. Porter* states the law of representation thus: "The mind tends to act again, more readily, in a manner or form which is similar to any in which it has acted before in any defined exertion of its energy." *Elements*, page 237.

This statement of the law is preferable to those before made, since, as Dr. Porter says, "the force to attract, or suggest, or recall another object, comes not from the sameness of the part to the whole *objectively* viewed, but from the similarity of two or more mental percepts, or mental images regarded subjectively, or as the product of the mind's similar activities." The law as stated by Dr. Porter is nearly equivalent to the following:

8th. *The law of integration.* The mind tends to complete any process which it enters upon, if it has performed that process before. Cause and effect, for example, suggest one another, since, in thought, they are elements of the same process. This is satisfactory, so far as the completion of a process is concerned; but it does not clearly account for the transition from one process to another.

9th. *The law of transition.* If two processes have similar elements, the mind, when representing either of these elements, is acting as if it were representing the other, and thus the transition from the one process to the other becomes possible. The similar elements in the

two processes are occasioned by similar or antithetical elements in two objects or complex representations.

The complete law of representation is, therefore, complex, and may be named and stated as follows:

10th. *Integration, then transition, then integration.* When the mind enters upon either of two processes having a common element, it tends to complete that process by the law of integration; but when reaching the similar element, it may make the transition, and complete the second process by the law of integration; and, in like manner, it may pass from process to process through a long series.

**2. The special or secondary** laws are those which regulate the recurrence of the idea of a particular object of a class to an individual mind.

The laws or conditions which modify the tendency of an idea to recur are the following:

1st. *Time of contemplation.* Time is a condition of a clear apprehension of an object and its relations, and hence has an influence on the probability of the recurrence of the corresponding ideas.

2d. *Vividness of apprehension.* What is vividly apprehended is likely to be recalled; and the more vivid the apprehension, the more likely the recurrence.

3d. *Frequency of repetition.* Repetition adds to the clearness and distinctness of apprehension, thus revealing new qualities and relations, and increasing the associations, and consequently the probability of the recurrence.

4th. *Recentness of the date.* The impression fades with time, since the mind becomes occupied with new objects and thoughts; hence, the probability of recurrence is greater as the date is more recent.

An exception to this law is found in the memory of the aged, who remember the scenes and events of their

youth, but are unable to recall those of a more recent date. This exception is explained by the second law—the vividness of apprehension. In youth, there is a more vivid apprehension, since at that period of life, the senses are acute, the imagination active, and the feelings ardent; but the reverse is usually true in old age. For this reason, the aged lose their interest in the present and dwell on the past. The remedy for this is to keep up habits of activity, both of body and mind, to extreme old age.

5th. *Freedom from entangling relations.* If the multiplicity of relations should divide the attention and weaken the interest in a particular object, that object would be less likely to be recalled. "The song which we have never heard but from one person, can scarcely be heard again without recalling that person; but there is obviously much less chance of this particular suggestion, if we have heard the same air and words frequently sung by others." But if we have formed the habit of recalling the first singer whenever we hear that song, the probability of recalling that singer will be increased with the number of repetitions, whoever be the singer by whom the song is rendered. A picture seen at a private house is more likely to be recalled than if it had been seen with a multitude of others at the Centennial Exposition, unless something remarkable in the picture secured for it more than ordinary attention.

6th. *Strength of the original apprehension.* The more powerfully the mind acts in a particular manner, the more likely it is to act in that way again.

7th. *Interest or feeling excited.* The mind seeks to return to that which affords it pleasure.

8th. *Favoring condition of health.* The vigor of the mind and consequent grasp of the object is increased by an increase of health.

9th. *Conformity with prevailing habits.* The facility and clearness of apprehension is enhanced when the object belongs to a class which we are at present studying with interest. If a person has formed the habit of classifying his knowledge, he will more readily recall what is presented properly classified.

10th. *Aptitude of body or mind.* There is an original difference in the aptitude of different persons for performing certain actions or for discerning objects and relations of a certain class; and there will be a corresponding difference in their powers of recalling those objects and relations.

## CHAPTER III.

### PECULIARITIES OF REPRESENTATION.

**1. Obscure links.**—One idea sometimes follows another, between which we can trace no connection. How is this fact to be explained? Several theories have been proposed, as the following:

1st. *Stewart's theory.* Between the two ideas, apparently disconnected, there intervene other ideas which serve as connecting links. Of these links, the mind is conscious at the time, but immediately forgets them, since they attract no attention. Examples of the fact that an event known at the time of its occurrence may be almost instantly forgotten, will occur to the reflective mind, as hearing the striking of a clock or the ringing of a bell. It is evident that such ideas, though instantly forgotten, might serve as links connecting those ideas in the train of representations that are remembered. In certain cases, at least, this theory is satisfactory.

2d. *Hamilton's theory.* Hamilton urges in explanation of the fact of the occasional want of connection between the ideas of a series of representations, the principle of latent or unconscious modification of mind, the honor of whose origination he ascribes to Leibnitz. Hamilton says: "This is the case with the mental modifications in question; they are not in themselves revealed to consciousness, but as certain facts of consciousness necessarily suppose them to exist, and to exert an influence in the mental processes, we are thus constrained to admit, as modifications of mind, what are not in themselves

phenomena of consciousness. . . . . Of consciousness, however faint, there must be some memory, however short." *Metaphysics*, pages 242, 246.

This view Hamilton illustrates by a row of ivory balls in contact, the ball at either end being struck by another ball rolling in the direction of the row. All the balls of the row keep their position except the last ball, which rolls off with the velocity of the striking ball.

This theory of latent modifications of mind is not consistent with Hamilton's opinions, elsewhere expressed, that "every act of mind is an act of consciousness," and that "we must say of every state of mind, whatever it may be, that it can be nothing else than it is felt to be." That which is felt is not a latent modification.

*Dr. Porter* remarks on Hamilton's theory as follows:

"In the very case supposed, when one idea suddenly and strangely follows upon another, if we bethink ourselves at once, we can recall some intervening links. We say, if we bethink ourselves at once; for if the effort is made a few instants later, the clue will fall from our hands. At other times, when it seems to have totally escaped and eluded us, it can be recovered by persistent effort and determination. Now, the fact that, in some apparently desperate cases, we can succeed, demonstrates that the objects might have been—nay, that they actually were, present to consciousness, though they seemed not to have been. We have a right to infer, then, on grounds of analogy, that they are so in all cases. The analogy of acknowledged and similar phenomena is wholly with the first theory. Moreover, analogy would seem to suggest and confirm the principle, that where there is a feeble activity of consciousness there is a feeble hold upon the memory; and we conclude, conversely, that where there is the slenderest hold upon the memory, there must have been the feeblest possible en-

ergy of consciousness. What is intended by the phrase, *latent modification of consciousness*, is not altogether clear. If it be explained as only a very low degree of conscious activity, the two theories are in principle the same." *Elements*, page 244.

3d. *The theory of unconscious cerebration.* John Stuart Mill says: "We know that these lost sensations and ideas,—for lost they appear to be—leave traces of having existed; they continue to be operative in introducing other ideas, by association. Either, therefore, they have been consciously present long enough to call up associations, but not long enough to be remembered a few moments later, or they have been, as Sir W. Hamilton supposes, unconsciously present, or they have not been present at all, but something instead of them, capable of producing the same effects. I am myself inclined to agree with Sir W. Hamilton, and to admit his unconscious mental modifications, in the only shape in which I can attach any very distinct meaning to them, namely, unconscious modifications of the nerves. . . . .

cal antecedents, particular states of the nerves, it may well be believed that the apparently suppressed links in a chain of association, those which Sir W. Hamilton considers as latent, really are so; that they are not, even momentarily, felt; the chain of causation being continued only physically, by one organic state of the nerves succeeding another so rapidly that the state of mental consciousness appropriate to each is not produced. We have only to suppose, either that a nervous modification of too short duration does not produce any sensation or mental feeling at all, or that the rapid succession of different nervous modifications makes the feelings produced by them interfere with each other, and become confounded in one mass. The former of these suppositions is extremely probable, while of the truth of the latter we have positive proof. . . . .

"It is known that the seven prismatic colors, combined in certain proportions, produce the white light of the solar ray. Now, if the seven colors are painted on spaces bearing the same proportion to one another as in the solar spectrum, and the colored surface so produced is passed rapidly before the eyes, as by the turning of a wheel, the whole is seen as white. The physiological explanation of this phenomenon may be deduced from another common experiment. If a lighted torch, or a bar heated to luminousness, is waved rapidly before the eye, the appearance produced is that of a ribbon of light; which is universally understood to prove that the visual sensation persists for a certain short time after its cause has ceased. Now, if this happens with a single color, it will happen with a series of colors; and if the wheel on which the prismatic colors have been painted, is turned with the same rapidity with which the torch was waved, each of the seven sensations of color will last long enough to be contemporaneous with

all the others, and they will naturally produce, by their combination, the same color as if they had, from the beginning, been excited simultaneously.

"If any thing similar to this obtains in our consciousness generally (and that it obtains in many cases of consciousness there can be no doubt), it will follow that whenever the organic modifications of our nervous fibers succeed one another at an interval shorter than the duration of the sensations or other feelings corresponding to them, those sensations or feelings will, so to speak, overlap one another, and becoming simultaneous instead of successive, will blend into a state of feeling, probably as unlike the elements out of which it is engendered, as the color white is unlike the prismatic colors. And this may be the source of many of those states of internal or mental feeling which we can not distinctly refer to a prototype in experience, our experience only supplying the elements from which, by this kind of mental chemistry, they are composed. The elementary feelings may then be said to be latently present, or to be present, but not in consciousness. The truth, however, is that the feelings themselves are not present, consciously or latently, but that the nervous modifications, which are their usual antecedents, have been present, while the consequents have been frustrated, and another consequent has been produced instead." *Examination*, Vol. II., page 21.

*Dr. Carpenter* agrees with Mr. Mill and illustrates his view in the XIIIth Chapter of his *Mental Physiology*, by numerous interesting examples, to which the reader is referred.

**2. Unceasing tendency to the act of representation.**—After the mind is developed and furnished, through the senses, with the requisite facts, it could employ itself in endless representation, though the senses be for-

ever sealed. But this activity may be interrupted in two ways:

1st. *Objective interruption.* Every new object presented to the senses awakens perception and interrupts representation. Perception and representation may indeed go on together. Representation is, in fact, involved in perception, as its final element, but not that kind of representation which takes place in the absence of sensation. But the two acts, representation and perception, may not be equally energetic, though going on simultaneously. The mind may be so engaged with the repsentation that it no longer attentively observes, or the attention may be so absorbed in the observation that the representation practically ceases, though the new object perceived is the occasion of a new train of representations.

2d. *Subjective interruption.* The mind has power, by an act of the will, to interrupt one series of representations and to introduce another. This can be done, either by seeking a new object for observation, or by arresting one train of representations and introducing another, irrespective of observation, or by exerting the higher activities of its logical powers. The mind is, therefore, not wholly passive in regard to its train of representations, since it can change them at will.

There is also possible an indirect and, at least, a partial control over the spontaneous representations, since those images tend to recur which the mind dwells upon frequently and with pleasure.

It is, therefore, a matter of great consequence that we be careful in the selection of the objects upon which our minds are to dwell. "Whatsoever things are true, whatsoever things are honest, whatsoever things are just, whatsoever things are pure, whatsoever things are lovely, whatsoever things are of good report, if there be any

virtue, if there be any praise, think on these things." The contemplation of the true, the beautiful, and the good, will furnish the mind with noble ideals, and aid us in our advance towards perfection.

**3. Habit as affecting representation.**—Habit is the aptitude acquired by repetition. We may divide habits into two classes—bodily habits and mental habits, and these may be variously subdivided.

The *laws* of habit are the following: Acts tend to recur. The tendency to recur varies with the number of repetitions. The tendency to recur varies with the recentness of the repetitions.

Habit has great influence upon the train of representations. Those images upon which the mind delights to dwell, seem to recur spontaneously.

The laws of habit may be applied with great effect in forming or changing our modes of thought, or in molding moral character.

**4. Associations as lower and higher.**—The lower associations relate to objects of sense, consciousness, or representation, and depend chiefly on the relations of space and time.

The higher associations include the relations of cause and effect, reason and consequent, genus and species, and, in brief, all the logical and philosophical relations.

The ignorant are chiefly under the influence of the lower associations, though, to some extent, they are influenced by the higher; yet, in reference to the latter, they often make ludicrous mistakes, as when they assign to things accidentally connected, the relation of cause and effect. On the other hand, philosophers especially regard the higher associations, and consider the lower as of little consequence.

**5. The judgment influenced by association.**—In morals, vice is often regarded with favor, when indulged

in by the higher classes, and virtue with disfavor, when practiced by the lower.

In society, a new fashion is at first distasteful to the multitude; but, as it is associated with the higher classes, it becomes attractive, and is adopted by the lower; but, when it becomes associated with the vulgar, the higher classes reject it and adopt another fashion.

The influence of association is seen in the effect of names. Indignation may often be averted, offense avoided, or good will secured, by the choice of smooth words; or the reverse effect may be produced by the use of opprobrious epithets. "A soft answer turneth away wrath, but grievous words stir up anger."

Parties, sects, and schools of philosophy seek honorable names for themselves, and sometimes endeavor to fasten odious epithets upon their opponents, and success or defeat may turn upon the adoption of a name.

## CHAPTER IV.

### MEMORY.

**Memory** as an *act* is the retention, recollection, representation, and recognition of previous cognitions.

Memory as a *faculty* is both the capacity to retain, and the power to recall, represent, and recognize our previous cognitions.

It is essential to memory that some of the elements of a previous cognition be retained, recalled, represented, and recognized, as known in past time, though other elements of that cognition may be indistinctly recognized, and still others, not at all.

To remember a thing, it is necessary, not only to retain and recall a knowledge of that thing, but to represent and recognize the idea of that thing in its relations to space, time, and dependence.

In memory, a thing is posited in *space*, by representing its relations to other things in space, both as to direction and to distance; — to direction, as above or below, before or behind, at the right or left, north, south, east or west, — to distance, as near or remote, given definitely or indefinitely.

By memory, a thing is posited in *time* in its relations to other things in time, as simultaneous, or as antecedent or consequent; and in the latter case, as immediately successive, or separated by an interval more or less prolonged, given definitely or indefinitely.

Things are also represented in memory in the relation of *dependence*, as condition and conditioned, reason and

consequent, cause and effect, producer and produced, means and end, whole and part, container and contained, ruler and subject, sign and thing signified.

The *elements* involved in memory are retention, recollection, representation, and recognition.

1. **Retention** is the keeping of past acquisitions. It is the conservative element of memory.

The fact of retention is not certified to by consciousness, but is inferred from the fact that a past cognition can be recalled, represented, and recognized.

By retention we are not to understand that the idea of a past cognition is consciously kept in memory; for that would imply representation, and recognition as well as retention, but that the effect of the original cognition so remains that the mind has the power to reproduce and recognize its representative idea.

In the sense just stated, retention can be clearly proved, thus: Let there be a perception of an object which we shall call *A;* and after an interval, perhaps of days or years, let the perception of another object called *B*, recall the idea of *A*. Then, it is clear, that the effect of the perception of *A* still remained in the mind; for, if not, the mind would be in the same state as if *A* had never been perceived, in which case, *B* could not recall *A*, since *B* could not recall *A*, if *A* had never been perceived; but since *B* does recall *A*, the mind is not in the same state as if *A* had never been perceived,—that is, the effect of the perception of *A* still remained in the mind.

In *illustration* of retention, Plato likens it to a tablet on which impressions can be made; Cicero, to a storehouse in which goods can be stowed away; Gassendi, to a piece of paper or cloth, which, receiving certain folds, retains the tendency to receive the same folds afterwards.

The theories offered in explanation of the fact of retention may be reduced to two—the physiological and the psychological.

The *physiological theory* maintains that, in original perception, impressions, more or less permanent, are made on one or more of the organs of sense, and communicated to the brain. Retention is referred to the abiding effect of the molecular change which took place in making the original acquisition, or to the tendency of the cell grouping of the nervous centers to recur.

The *psychological theory* maintains that any psychical phenomenon, as an act, implies a change or modification of the state of mind. Hence, the effect of this change must remain in the mind; for any state of the intelligence is the resultant of all its preceding acts or modifications; and in this fact is found the explanation of retention.

**2. Recollection** is that act by which past acquisitions are recalled. It is the reproductive element of memory. The *condition* of recollection is retention.

As to *kind*, recollection is either involuntary or voluntary, according as it is spontaneous or is occasioned by an act of the will.

By *involuntary* recollection, certain past acquisitions are recalled, without an effort of the will, through their association with ideas already present to the mind. As all acquisitions are related by their common dependence on the same mind, it would seem that any acquisition might, according to the law of association, suggest any other; but as these acquisitions are related to each other with different degrees of intimacy, some will be more likely to be recalled than others, and, by their recall, the others will be practically excluded, since the mind can not attend to all at the same time. Some acquisitions that are even recalled may, on account of their

obscurity, fail to elicit attention, disappear from consciousness, and be forgotten.

By *voluntary* recollection, past acquisitions are recalled through an effort of the will. At first thought, voluntary recollection appears to be self-contradictory; for, in seeking to recall a thing, it would seem that we already know what we wish to recall. But we may know generically, though not specifically, or specifically though not individually, or in part yet not in whole, or obscurely yet not vividly. Thus, we may know that it is the name of a certain individual that we wish to recall, and yet not be able to recall the name itself. We may also wish to make our recollections more clear and vivid.

The *law* of a good recollection is the following: *The power of recollection is increased by exercise.*

The following *conditions* are to be observed as supplementary to the law of exercise:

(1) Make the acquisitions under proper conditions of place, time, and physical and mental states.

(2) Preserve the health of the body and the vigor of the mind.

(3) Give attention to the original acquisitions.

(4) Secure clearness of cognition and interest in the object.

(5) Ascertain relations and classify.

(6) Associate the object with other things.

(7) Repeat the cognitions and recollections.

(8) Make frequent and truthful communications.

An application of the above law and conditions will greatly strengthen the power of recollection.

The *degrees of forgetfulness* are the following:

(1) When the displacement is momentary.

(2) When the withdrawal of attention is voluntary.

(3) When the recollection requires an effort.

(4) When we can not, at present, recall.

(5) When repeated efforts to recall have failed.

(6) When we have abandoned all effort to recall.

It is not, however, to be inferred that the recollection of any past acquisition is impossible; for it may recur unexpectedly; but we should remember that we can not recall what we never knew. We should therefore make the original acquisitions clear and complete.

3. **Representation** is the act by which past acquisitions, conserved by retention, and recalled by recollection, are reconstructed in consciousness. It is the constructive element of memory.

The *conditions* of representation are retention and recollection; for, without these, representation itself would be impossible.

The representations, as found in memory, correspond to the appearances of past realities with their attending circumstances of place and time. These representations are, by their fidelity to the appearances in past acquisitions, distinguished from the ideal creations of the imagination, and from the grotesque products of the phantasy as experienced in reverie and dreaming.

4. **Recognition** is the act by which the ideas of past acquisitions, retained, recalled, and represented, are identified as former possessions of the mind. It is the identifying element of memory. Identification implies the comparison of things essentially alike. Recognition is the completion of the processes involved in memory, and without it, though conscious of representations, we should be ignorant of their relations to past acquisitions.

The *conditions* of recognition in memory, are retention, recollection and representation; for, without these, recognition would be impossible.

The *elements* involved in recognition are as follows:

(1) A present image of a past acquisition, retained, recalled and represented.

(2) The identification of the present image as truly representing a past acquisition of our experience.

(3) Faith in the trustworthiness of memory.

(4) Time implied in the discrimination of the date of the present representation from that of the past acquisition represented.

(5) Personal identity or the essential sameness of the ego at the two dates.

The appearance in perception may be compared with its representative idea in memory, thus:

(1) In perception, a material object is present, causing a sensation. Intuition apprehends the conditional necessity of the ego as the subject of the sensation, and of the object as the cause of the sensation. The judgment infers what the cause is. The imagination, under the stimulus of sensation and inference, constructs the appearance embodying the inference. This ideated appearance is committed to the retentive capacity of memory, and passes from consciousness, the mind retaining only the effect of the process, and that unconsciously.

(2) In memory, the mind is able to retain the effects of its previous acts, and hence to recall, represent and recognize the ideated appearance, though the external object and the sensation caused by it are wanting.

(3) In perception, the original appearance is constructed by the imagination under the stimulus of the sensation caused by the object.

(4) In memory, the revived appearance is constructed by the same power, in the absence of the sensation caused by the object.

(5) In perception, the original appearance is vivid and rich in elements.

(6) In memory, the revived appearance is less vivid than the original, is more indeterminate, and is composed of fewer elements.

The *varieties* of memory can, in part, be accounted for by the prominence, or deficiency, or relative activity of the elements of retention, recollection, representation and recognition.

The *prominence of retention* is manifested in the reliability of memory, or the probability that what has been committed to it will not be forgotten. The *deficiency of retention* is shown by forgetfulness; but forgetfulness can, in part, be accounted for by supposing the mind occupied, and the attention engaged with something else.

As recollection is the proof of retention, it would seem that we have proof that but a small part of our acquisitions are retained, since the greater part are, perhaps, never recalled: but since, under special conditions, much is recalled that had been long forgotten, it may be inferred that much is retained that is never recalled, and it may, indeed, be questioned whether any acquisition is ever absolutely forgotten.

The prominence or deficiency of *recollection*, in its spontaneous form, is manifested in the presence or absence of the ready memory; the prominence or deficiency of intentional recollection, by the presence or absence of the tenacious memory.

The *character* of the memory varies according to the law of association employed. The employment of the law of contiguity in space or time gives rise to the ordinary memory of fact. The employment of the law of correlation gives rise to the philosophic memory. The observance of the secondary laws of representation, and the law and conditions of recollection, tends to give us the complete control of all of our possessions, by developing a universal memory. We are apt to remember what we are interested in; and on this account, some minds remember facts, other minds, principles. We should take an interest in what we wish to remember.

The prominence or deficiency of *representation* is manifested in the vivid or indistinct memory. An active representative power enables us to see clearly, with the mind's eye, the scenes of the past, and to portray them in vivid pictures.

The prominence or deficiency of *recognition* is manifested in the completeness or incompleteness of the parts of the representation which are recognized.

A perfect memory requires the perfection of all the elements — retention, recollection, representation and recognition. A good memory is partly the gift of nature, and partly the effect of cultivation; and in the differences of constitution and cultivation, we find an explanation of the varieties of memory.

The *cultivation* of memory, in consideration of its utility, is a matter of great importance. Memory is most effectively cultivated by studying its nature, obeying its laws, and exercising it under proper conditions.

Retention is cultivated by committing to it a great number and variety of well-defined acquisitions, and by making frequent demands upon it to deliver up its stores.

Recollection is cultivated by exercising it in conformity with its law and conditions. The power to reproduce our mental treasures is developed by the act of their reproduction.

Representation is cultivated by making the original acquisitions clear and distinct, and by representing all their elements in vivid pictures, and by repeated efforts.

Recognition is cultivated by habitually identifying all the elements of the representative ideas.

The great principle for the cultivation of memory is the law — *exercise strengthens.* The memory should not, however, be overtaxed. Exercise should be interrupted by intervals of rest.

Attention to facts and details gives the ready memory;

and the study of principles, relations, and laws gives the philosophical memory.

*Examples* of great memory are abundant, and but few need be mentioned.

It is said that Hippias, on hearing five hundred words, could repeat them in their exact order; that Seneca could repeat two thousand names in the order given; that Cyrus and Hannibal knew the names of all the soldiers in their respective armies; and that Themistocles knew the name of every citizen of Athens.

These were men distinguished for great intellectual power in other respects; and hence the opinion is disproved that great memory is the attendant of a weak judgment. This may be true when the memory concerns itself with trivial occurrences, to the exclusion of general facts and philosophical principles; but the stock of knowledge of an able man is usually not small, and of this stock he has complete command. The reason for this complete control of his acquisitions, is the fact that he refers particular cases to general principles. This is philosophical memory. It may sometimes appear less ready than ordinary memory, since it requires time to recur to principles, but it is more sure. Thus, one person may learn the rule for an arithmetical process, and another may be able to think out the reason. If the first forget his rule, he has no resource; but if the second forget the process, he can think it out again. Stewart says: "They who are possessed of much acuteness and originality, enter with difficulty into the views of others, not from any defect of their power of apprehension, but because they can not adopt opinions which they have not examined." *Philosophy*, page 251. Such persons prefer to think for themselves.

Muretus mentions a Corsican to whom he dictated words,—Latin, Greek, barbarous, significant, and non-

significant, disjointed and connected,—until he worried, not only himself, but the young man who wrote them down, and the spectators. The Corsican was the only one of the whole company who was alert and fresh, and he continually asked Muretus for more words. After Muretus ceased to give more words, the Corsican began and repeated all the words in the same order without the slightest hesitation. Then, commencing at the last, he repeated them backwards, till he came to the first. Then again, he repeated the first, the third, the fifth, and so on; and he repeated them in any order desired, without the smallest error.

Paschal, Scaliger, Leibnitz, Euler, and Hamilton are examples illustrating the fact that great memory may accompany great powers of mind in other respects. The memory and the judgment are, in fact, friendly faculties, and either is ready to assist the other.

Hamilton says of Scaliger: "The retentive faculty of that man is surely not to be despised, who was able to commit to memory Homer in twenty-one days, and the whole of the Greek poets in three months; and who, taking him all in all, was the most learned man the world has ever seen. . . . . During his life-time, he was hailed as the Dictator of the Republic of Letters, and posterity has ratified the decision of his contemporaries, in crowning him as the prince of philologers and critics." *Metaphysics*, pages 413, 425.

## CHAPTER V.

### IMAGINATION.

**Imagination,** as an act, is that form of representation in which the constructions are subjective ideals.

The *faculty* of imagination is the power to perform the act of imagination.

*Images* are the products created by the act of the faculty of imagination.

The *characteristics* of the imagination are its picturing, modifying, and creative powers.

By its picturing power, the imagination constructs pictures or mental images.

By its modifying power, the images are varied at pleasure, and thus released from correspondence to past reality, as in memory.

By its creative power, it forms, for rational purposes, ideals of the true, the beautiful, and the good, or of their opposites.

The images are *restricted* to space, time, possible form, thought relations, and elements of experience.

The images are subject to the relations of space. They are represented as having situation, magnitude, and form, and as sustaining to one another the relations of direction and distance.

The images are subject to the relations of time. They are represented as having date and duration; as past, present, or future; one as simultaneous with another, or as preceding or succeeding it, immediately, or separated by an interval more or less prolonged.

The images are restricted to possible form. Thus, a form involving conflictive elements is impossible, and hence can not be imagined, as a round square, or a spherical cube.

The images are restricted to thought relations. They are represented under the relations of the condition and the conditioned, whole and part, etc.

The images embrace elements known by experience. Images of material things are limited to such qualities as are known through the senses; and psychical representations are limited to such phenomena as are revealed in consciousness.

The *phases* of this power are exhibited in positing, magnifying or diminishing, distorting, decomposing, recomposing, compounding, anticipating, creating, annihilating, and recreating.

The images may be posited in various relations to one another in space as to direction and distance, and in time as to date, or duration, or order of succession.

The images, though maintaining the due proportion of their elements, may be indefinitely increased or diminished in magnitude. Thus, as in Gulliver's travels, we can imagine Lilliputians or Brobdingnags, and other things to correspond. We may imagine a human being with the intellect of an idiot or that of an angel; as in unison with God and exhibiting the fruits of the Spirit in a holy life, or as possessed of Satan and manifesting all possible wickedness.

The proportion of the parts may be varied so as to give distorted images. Thus, we can imagine a man with a head larger than the rest of his body.

The whole may be resolved into parts which may be separately represented. Thus, we can picture a head or a hand detached from the body.

The parts of wholes may be recombined in a different

order, so as to form a new whole, and thus transform the shape into any possible form.

Parts of one whole may be combined with parts of another whole. Thus, we can imagine a mermaid, a centaur, a griffin, a man with the head of a dog, etc. We can imagine any attribute joined with any substance.

Guided by memory and judgment, the imagination constructs images embodying its anticipations or expectations of future events.

Images may be constructed according to certain laws of form, or from equations. We may thus create forms such as we have never seen. Thus, we may construct the curve represented by the equation, $x^3 = (a - x)\, y^2$, called the *Cissoid of Diocles.*

We may imagine every thing swept from existence, leaving space and time infinite voids. In this void space, imagine a point to move in one direction, with a given velocity for a certain time, thus generating a line whose length is equal to the product of the velocity of the point by the time of its motion. Imagine this line to revolve in the same plane about its origin as a center, thus generating a circle whose radius is the revolving line. Imagine the circle to revolve about any diameter, thus generating a sphere whose radius is equal to the radius of the circle. In this sphere we may imagine every possible form, and every variety of being, and, in fact, a new universe.

The *utility* of the imagination is manifested in practical life, in science, in art, in morals and religion.

In every-day life and in the mechanical arts, the imagination is employed in adapting means to ends. Inventive genius, by the aid of the imagination, constructs instruments and machines, and calls in the aid of natural forces.

A good mathematical imagination is of great service

in science, and is even indispensable to a well-developed mind. The explanation of many phenomena is first represented by the imagination, and afterwards confirmed by observation or experiment, and thus the hypothesis becomes a theory. There are other hypothetical explanations of phenomena, such as the relation of ether to light, which genius invents by the aid of a creative imagination, which satisfy the mind, though perhaps never to be verified.

There is a wide field for the employment of a creative imagination in the fine arts — Landscape and Architecture, Sculpture and Painting, Music and Poetry.

The imagination forms the ideal standard of attainment for moral and spiritual excellence. It elevates the soul by throwing the charm of a poetic ideal around the life of duty. We should, however, guard against the tendency to clothe the actions of selfish genius with the garb of virtue, or to adorn the head of the ambitious conqueror with the halo of glory.

The *cultivation* of the imagination is promoted by laying in a store of exalted images drawn from the works of Nature and Art, or from the worthy sacrifices of virtue and the noble deeds of moral heroism. The imagination is cultivated by the exertion of its powers in creating ideals of the true, the beautiful, and the good.

The study of pure literature is the most effective means for the cultivation of the imagination. Here we find, in rich profusion, the beautiful creations of lofty genius.

## CHAPTER VI.

### PHANTASY

**Phantasy,** as an *act*, is that form of representation in which the mind is a spectator of a series of images severed from the usual relations of cognition.

The act of representation, which seldom ceases, takes the form of phantasy, in case of the suspension of recognition involved in memory, and of thought and volition involved in imagination.

Phantasy, as an *object*, is the product of the act of phantasy. These products are called phantasms, specters, apparitions, etc.

Phantasy, as a *faculty*, is the power to perform the act of phantasy in the production of phantasms.

The most general *division* of phantasy is into the phantasy of wakefulness, the phantasy of sleep, and the phantasy occurring indifferently either in wakefulness or in sleep.

The phantasy of *wakefulness* takes the forms of reverie, hallucination, intoxication, and insanity.

*Reverie* is the simplest form of wakeful phantasy. It occurs when, as in a state of lassitude of mind or body, the higher acts of thought and volition are suspended, and the mind gives free rein to the action of the representative power. The pictured products, or phantasms, are thus, by the automatic action of the representative power, severed from all relation to other things in space and time. The current of images may be determined by the sensations received passively through the senses,

and modified by the laws of association. Reverie may be induced by contemplating, for a short time, a single object, and then passively yielding to the train of suggestions. For interesting examples of reverie, consult *Dr. Carpenter's Mental Physiology*, Chapter XIV.

*Hallucination* arises from a morbid condition of the nervous system, causing certain appearances called spectra, apparitions, or phantoms. Spectra occur spontaneously in certain conditions of the sensorium, occasioned by stimulants, sickness, anxiety, or trouble. These phantoms assume definite forms and positions; they appear with distorted faces; they stand, or sit, or walk. The mind can not, for the time, get rid of the appearances, though knowing that they are not real objects.

If the organs of vision could be affected by any other means, as they would be affected by a visible external object, that object apparently is seen. False vision of this kind may be called *pseudopia*. Dr. Clark says: "Not only is the angular gyrus capable of registering impressions, but it can reproduce them under the influence of an appropriate and sufficient stimulus. . . . . Visual impressions, which are to a greater or less extent pictorial on the retina, become, in the tubercula quadrigemina, optic thalami, and angular gyri, cell-groups, or modified cell-manifestations. Each specific group or manifestation is the cipher or hieroglyphic of a specific visual object. Such being the mechanism of sight, it is evident that whatever will produce in any of the visual centers a cell-grouping or modification, which is the representative of any object, as a rose, a dagger, or a face, will also produce the subjective sensation or idea of the object. Ordinarily, this occurs only when an object is presented externally to the eye, and the rays of light falling from it on the retina set the whole visual apparatus in action. Sometimes, however, causes which

are purely intra-cranial will revive old cell-groups or modifications, and the subjective result is the seeing of objects of which there is no external existence. . . . . Association utters a call for the assembling of a cerebral cell-group; habit enables it to form with facility; emotion imparts distinctness to it; expectant-attention anticipates and urges its appearance; automatism gives it power to act; and the ideational centers welcome and utilize the result." *Visions*, pages 119, 153.

*Intoxication* results from the action of alcoholic or narcotic stimulants upon the nervous system. The consequences of habitual intoxication are *mania*, or temporary aberration of the intellect; *frenzy*, or temporary madness; *delirium*, or surrender to wild and terrifying fancies; *idiocy*, or mental imbecility; *degradation*, or the loss of every thing desirable — property, character, self-respect, happiness, hope.

*Insanity* is a disordered state of mind contined for an indefinite period. It is characterized by unbalanced mental action, the possession of the mind by some dominant idea, or the suspension of the power of the will to control its own action. Insanity may be induced by abnormal action, physical or mental, or by any thing which causes lesion of the nervous system, or occasions disordered action of the brain. Mania, frenzy, delirium, and idiocy, attending intoxication, are examples of incipient insanity.

Phantasy in *sleep* takes the forms of dreaming, nightmare, and somnambulism.

*Dreaming* is that action of the phantasy which occurs in natural sleep.

The *causes* of dreams are the state of the body or of the mind, or external agencies, physical or spiritual.

Dreams may be induced by indigestion, nervous affection, weariness, or ill-health.

The scenes and thoughts of the day often recur as the dreams of the night. An eminent English judge dreamed that lizards were crawling over him. The clock in the room in which he slept had on it figures of crawling lizards, which he must have seen before retiring, though he did not recollect this in the morning. The materials of dreams are, no doubt, often supplied by the traces of the knowledge of events long ago forgotten.

Sounds heard in sleep occasion or modify dreams, as thunder may induce the dream of a battle. A blister on Dr. Reid's head caused him to dream of being scalped by the Indians. A hot bottle at the feet of Dr. Gregory caused him to dream of walking on Mt. Etna. But why Mt. Etna rather than Mt. Vesuvius? Other causes were at work besides the hot bottle.

The *characteristics* of dreams are peculiar and remarkably interesting.

The representations in dreams are mistaken for objective realities. The dreamer believes that he is in a real world, oblivious of the fact that he is in a world of shadows.

The appearances in dreams are often grotesque, and the inferences drawn irrational. This is explained by the absence of the influence of real objects, as in perception, and by the quiescence or imperfect action of the higher powers of thought.

Efforts are sometimes put forth in dreams which indicate activity of the will, at least in a low degree; but dreams are usually characterized by the absence of rational purpose, and the will is not called into action.

In certain dreams, the representative power, freed from the control of the will, acts automatically, and following out the suggestive clew, without restraint or guidance, often reaches surprising results; hence, in

dreams, lost things have been found, problems solved, and discoveries made, which could not have been done in a state of wakefulness.

One of the most remarkable of the peculiarities of dreaming is the rapidity of the mind's action. Events which, in real life, would require days, or even years, are witnessed in dreams in a few seconds, though, to the mind of the dreamer, they appear to occupy the time naturally required.

Dreams are sometimes remarkable on account of the absence of surprise at the grotesque appearance, or of joy or sorrow which would attend our knowledge of corresponding real events. In other cases, dreams are attended with intense excitement of the sensibility. Thus, a dream of danger excites fear, and a dream of deliverance, gratitude.

Does the mind always dream in sleep? This is not a settled question. It is no proof that we have not dreamed because we have no remembrance of dreaming. We forget dreams as we forget other things. It is no proof that the mind always dreams in sleep, to assume that continued activity is essential to the continued existence and identity of the soul. This would follow from the hypothesis that the soul is activity and nothing else; but it does not follow from the hypothesis that the soul is a substantial personality; for such a power may be active or quiescent. The non-exertion of a power does not imply its non-existence. Force is the exertion of a power, and hence is always acting; but not so the power itself. Whether the mind always dreams in sleep will, perhaps, remain undecided.

*Nightmare* is a distressing form of dreaming resulting from imperfect circulation of the blood. The sufferer imagines himself in some distressing situation, and yet is unable to help himself or to call for assistance.

*Somnambulism* is that condition of the nervous system in which a person performs, during sleep, actions appropriate to the waking state, such as walking, the act implied in the name. Somnambulism assumes one of three forms — natural somnambulism, morbid, or artificial.

*Natural somnambulism* may occur in ordinary sleep. Certain powers may be awake while others are asleep. As in dreaming, there is the absence of voluntary control over the current of thought, and the mind is subject to the control of some dominant idea; yet, the somnambulist, unlike the dreamer, has the use of some of his senses, and the control of his muscular organs. He can walk; he may see, though he does not hear or feel, or hear and not see. There may be complete abstraction from every thing except that which is connected with the dominant idea; but in relation to this, there may be great activity. Thus, in this state, a mathematician solves a difficult problem; an orator delivers an eloquent speech; a musician produces enchanting harmonies. For examples, the reader is referred to *Carpenter's Mental Physiology*, Chapter XV.

*Morbid Somnambulism* is induced by disease. It differs from natural somnambulism, which is both preceded and followed by ordinary sleep, in the fact that it may occur suddenly in a state of wakefulness. Extraordinary powers are exhibited, as if the mind were under the influence of another mind, or guided by supernatural power.

*Artificial somnambulism*, called also *hypnotism*, is that form of somnambulism which is artificially induced. It may be induced by "the maintenance of a fixed gaze, for several minutes consecutively, on a bright object placed somewhat above and in front of the eyes, at so short a distance that the convergence of their axes upon it is accompanied with a sense of effort, even amounting to pain." *Mental Physiology*, page 601. The subject is

credulous, and his feelings are easily excited. He is under the complete control of the operator through whose agency he was put into this state.

There are certain characteristics common to the three varieties, as the following:

The leading activity is that of the representative power, and the creations of this power chiefly solicit the attention and engage the energies of the mind.

Some of the senses are awake and highly sensitive, and perceptions remarkable for acuteness blend with the train of representations. Thus, objects are seen by the faintest light, and the subject walks securely in the most dangerous situations.

Does the somnambulist really employ his senses? He undoubtedly perceives; for, he acts in reference to real objects, since he shuns obstacles, walks securely along elevated timbers, and with skill handles a pen, or plays on a musical instrument. These objects are known to him; they are real objects, and not the creations of his phantasy. As we know external objects normally by perception through the senses, it is more philosophical to suppose that the senses, the ordinary means of perception, are unusually sensitive, and that the mind perceives through them, than that it perceives through unknown avenues.

Those cases in which great intellectual powers are displayed, can be accounted for by the excitement of the nervous system, and the concentration of the entire power of the mind into the effort of the few faculties brought into action.

What occurs in a paroxysm, is often forgotten by the mind on recovering its natural state, and remembered in a subsequent paroxysm.

Phantasms occurring in either *wakefulness* or sleep, take the forms of clairvoyance and visions.

*Clairvoyance* is the power of discovering objects which are supposed not to be perceptible through the senses. This state is analogous to hypnotism, or artificial somnambulism, if indeed it is not identical with it.

The *conditions* of clairvoyance are: an excitable condition of the nervous system; certain external influences acting upon the sensitive organism; a deficiency, for the time being, of will power; a predominence, at least temporary, of feeling over volition, and of representation over the other cognitive acts.

As to *form*, clairvoyance is *involuntary*, when induced in the subject without his consent, though not necessarily against his will; or *voluntary*, when the subject yields himself up, of his own accord, to external influences or to the will of another.

As to the *phenomena*, it is claimed that the clairvoyant can see, for example, the diseased parts in the interior of his own body, or objects through a bandage or a thick wall, or at a distance too remote for vision.

After allowing for exaggeration, guess-work, deception, and the drawing of information from others by questions or cautious generalizations, these phenomena may perhaps be explained, in part, at least, by the condition of the subject, and his relation to physical influences or to other minds, if indeed there would be left any thing to be explained.

The subject is in a highly sensitive condition, and his representative power is abnormally active. In case of internal disease in his own body, it is plain that the sensations would suggest the nature of the disease which the activity of the representative power would vividly picture. It would be very natural, in such a case, to mistake representation for perception; and this is probably done when objects at a great distance are supposed to be seen, as cities on the other side of the globe.

The condition of the subject renders him peculiarly susceptible to magnetic or electrical influences. His mind is in intimate sympathy with other minds, and in some way, through mesmeric or higher spiritual influence, seems to participate in their knowledge.

The phenomena of clairvoyance and those of kindred nature have by some been attributed to the influence of disembodied spirits, as in modern spiritualism.

A *vision* is the appearance of something, as if seen, when there is, through the eye, no corresponding perception of an objective reality.

The *conditions* are a highly sensitive nervous system and an intense activity of the representative power.

The *forms* are natural vision — that induced by natural agency,— and supernatural vision — that induced by supernatural agency. The truth of prophecy can not be decided *a priori*, but must be determined *a posteriori*, by evidence, the same as that of historical questions.

# DIVISION III.

## ELABORATION AND THE ELABORATIVE FACULTIES.

## CHAPTER I.

### ELABORATION.

**Elaboration** is the process by which the intellect arranges objects into classes, and forms and applies generalized concepts or notions of these classes.

The *processes* of elaboration are classification, conception, judgment, and reasoning.

The *products* of elaboration are classes, concepts, judgments, and arguments.

The *conditions* of elaboration are the acquisitions through consciousness, reflection, rational intuition, and perception, the acts and products of representation, also the faculties implied in elaboration.

The *faculty* of elaboration is variously denominated, thus: The *elaborative* or *discursive faculty*, since it is employed in working up, into higher forms, the materials supplied by acquisition and reproduction; the *logical faculty*, since it is the faculty employed in logical processes; the *comparative faculty*, since comparison enters, as an essential element, into all its processes; the *faculty of relations*, since it deals with relations; the *thought faculty*, since its acts are styled thought; the *rational faculty*, *understanding*, or *intelligence*, since it is the faculty which characterizes man as rational, and thus distinguishes him from inferior beings.

Let us now give a brief recapitulation of the acts of cognition:

*Consciousness* is the experience which the soul has of its phenomena. It is essential to cognition; for without it, any supposed process would be to us as zero. Consciousness involves judgment. To be conscious of a phenomenon involves the judgment, usually informal and unexpressed, of the existence of that phenomenon as opposed to its non-existence. But consciousness is the experience of a determinate phenomenon; hence, the judgment involved in consciousness is not that of bare existence, but of a determinate existence, involving the identity or peculiarity and particularity of the phenomenon, and thus implying an act of comparison.

*Reflection* is the turning back of our cognition to the consideration of psychical phenomena. The processes involved in reflection are abstraction, attention, analysis, synthesis, comparison, identification or discrimination, and classification. Though primarily applied to the phenomena of consciousness, these processes are also employed in the investigation of the properties and relations of material things.

The classes formed by reflection consist of species, or collections of individuals having a common attribute, and of genera, or collections of species having more general attributes than the attributes severally characteristic of the species.

A class, as a collection of individuals or of species, can be represented by the imagination, though inadequately, since a greater or less number of individuals will, almost inevitably, fail to appear in the representation of the class; but a concept, as a generalized product of the logical faculty, embracing only elements common to all the members, can not, as will be shown more fully hereafter, be *imagined*, it can only be *thought*.

*Rational intuition* is the apprehension of the necessity of the conditions of phenomena. Thus, a phenomenon experienced in consciousness is, by rational intuition, referred to the conscious subject or the *ego*, which, as the subject of consciousness, is discriminated from the *non-ego*, that is, from every thing else. By rational intuition, the intellect apprehends the necessity of space and time, as the universal conditions of phenomena; of fundamental truth, as the condition of valid thought; of substance, as the underlying power which manifests conjoined attributes; of cause, or that which is efficient in producing events; of laws, or the modes of the occurrence of events; and of consequences, or the effects following. These intuitions play an important part in the processes of elaboration; and in all of them comparison and judgment are involved.

*Perception* is the process by which we gain a knowledge of the properties of external objects. The elements involved in perception are the sensational, the intuitional, the inferential, and the ideational. Perception involves comparison and judgment, and deals with the concrete.

*Representation* is the act by which the mind reproduces its acquisitions. It takes the form of memory, imagination, or phantasy, according as it deals with past realities, with ideals, or with phantasms.

Representation involves comparison and judgment, and deals with the concrete.

*Elaboration* generalizes its materials through the acts of comparison and judgment, and thus deals with the universal.

By an examination of the above processes, we discover that comparison is the typical act of thought, and that the typical product is the judgment.

It is not to be supposed that any one of the above processes takes place by itself, that is, in complete iso-

lation from the others. In fact, two or more of the processes occur simultaneously.

We have used the word *faculty* to include both an *active power* and a *passive susceptibility*, of the mind; but some writers use the word *faculty* to denote a *power* of the mind, and the word *capacity* to denote a *susceptibility*. Hamilton says: "We are surely entitled to say in general that the mind has the faculty of exerting such and such a class of energies, or has the capacity of being modified by such and such an order of affections. We here ex-cogitate no new, no occult, principle. We only generalize certain effects, and then infer that common effects must have a common cause; we only classify certain modes, and conclude that similar modes indicate the same capacity of being modified. . . . . No accusation can, therefore, be more ungrounded than that which has been directed against philosophers, — that they have generally harbored the opinion that faculties are, like organs in the body, distinct constituents of mind." *Metaphysics*, pages 269, 272.

The faculties, then, are powers, active or passive, with which the soul is endowed. Even the passive faculties, the susceptibilities, or capacities, are powers in the sense that the accompanying phenomena are due to their response to stimuli, or to their reaction against impressions.

## CHAPTER II.

### CLASSIFICATION AND CONCEPTION.

**Classification** is the process of forming groups of objects having common qualities.

In classification we may proceed by generalization — the arrangement of individuals into species, and of these species into genera; or by division — the resolution of genera into species, and of species into sub-species or individuals.

*Conception* is that process of elaboration by which the intellect forms general notions of classes of objects having common attributes.

The *product* of the act of conception is called a concept or notion. The term *concept* denotes the combination of common attributes which is produced by the act of conception; but the term *notion* denotes the marks or signs, *notæ*, by which the individuals of a certain class may be known.

*Generalization* embraces synthetic specification — the formation of species from individuals, and generification — the formation of genera from species.

The *importance* of generalization is obvious; for the objects of the universe are countless in number, while the mind is finite in its powers of comprehension. Were it not for the fact of generalization, the finite powers of the mind would be overwhelmed by the infinity of the universe. But one aim of science is to reduce multiplicity to unity; and in the realization of this aim, science has been highly successful, and has thus enabled the

human mind to grapple with the innumerable facts of the universe.

In generalization, we begin with an examination of individual things, whether psychical phenomena or material objects. By an *examination* of these things, we learn what we can of them through consciousness, reflection, rational intuition, and perception. The qualities thus discovered and represented in memory, if the objects be absent, can be predicated of these objects, thus forming individual judgments; as, this apple is red, etc.

By *comparison*, we find that many objects have similar attributes,— so far similar, that they may be regarded as alike, and hence as common. The same objects that possess similar attributes, may also possess dissimilar attributes. Abstracting our attention from the dissimilar attributes, and concentrating it upon the similar, we regard these objects as alike, since they possess similar attributes, and class them together. These common attributes are the marks or signs by which individual objects may be known as belonging to this class; and of any individual of this class, we may predicate any of the common attributes. Our ideas of the common attributes of a class, taken together as a combination, constitute our notion or concept of the class. Other classes, having other sets of attributes, may be formed in a similar manner, and thus the universe of objects may be formed into classes.

Strictly speaking, we abstract our thoughts from those attributes not common to the class, yet it is common to say that we abstract the common attributes, since we consider them apart from the other qualities possessed by a part only of the individuals of the class. The ideas of the common qualities thus said to be abstracted, are called *abstracts*, because they are considered apart from the attributes not common to all the individuals of the

class. In like manner, a single attribute of a single object, considered apart from the other attributes of that object, may be called an abstract. Thus, the form of a particular chair, considered apart from the other attributes of that chair, is an abstract.

If we should form abstract ideas, were it possible, of all the objects of the universe, we should not only be overwhelmed by their infinitude, but we should have ideas of qualities apart from their objects, in which state they do not exist in nature; and, viewing these qualities thus separately, we should have no knowledge of their mutual relation. Hence, we see the necessity of comparison, so that we may not only abstract but combine the common qualities, thus forming concepts or notions, by which we recognize all the objects having the qualities involved in the concept as a plurality of individuals embraced in the unity of a class.

By *generification*, we form genera from species. We do not rest at a first generalization by which we form species from individuals, and the concepts of these species; but comparing these concepts, disregarding their differences, we observe their common elements, which we abstract and combine into higher concepts of genera embracing the subordinate classes as species.

By comparing the concepts of these genera, disregarding their differences, abstracting and combining their common attributes, which become fewer as we ascend, we obtain still higher concepts, embracing a greater number of subordinate classes and individuals. In like manner, continuing the process, we arrive, at length, practically, at the summit of our ascent—the concept *being*, the highest genus, embracing all reality, both dynamical and non-dynamical.

By *denomination*, we assign names to the classes formed by generalization, and thus these classes, together with

the ideas, concepts, or notions of them become embodied in verbal signs.

We have called *being* the highest genus, and practically it is so; but as all thinking is relative, and implies discrimination, it follows that every class or concept has its negative; hence, in speculation, there is no highest genus. Thus, being is discriminated from its negative, non-being, and both being and non-being may be regarded as species of a higher genus, and so on. To these higher genera, no names have been assigned, as they are only objects of speculation. Though, absolutely, there is no highest genus, yet, practically, for all reality, being may be thus regarded; but, relatively to any science, there is some class or concept, lower than being, which may, for the special purpose of that science, be regarded as the *summum genus*.

By *division*, the reverse of generalization, we descend to the subordinate classes and individuals. If some of the objects of a class possess a quality not possessed by other objects of that class, this quality is a *difference* which divides the class into two species,—one characterized by the presence of this difference, and the other by its absence, though perhaps possessing another difference which also would have served as a mark of discrimination in dividing the class.

Beginning, then, at *being*, we divide and subdivide by introducing at each division the differences which characterize the species and enable us to discriminate them from one another. We thus assign to each species a less *extent*, that is, fewer classes and individuals than was assigned to the genus, but a greater *content*, that is, more attributes. The process of division may be continued till we reach the limit in the individuals. Thus, we may divide being into dynamic being and non-dynamic; dynamic, into matter and spirit; matter,

into organic being and inorganic; organic, into animal and vegetable; animal, into vertebrates and invertebrates, and so on, till we reach dog, spaniel, and the individual *Wag.* Each logical division is *bifurcate*, having two branches, that is, a *dichotomy*, having two members.

The *lowest species*, practically, is that whose division will give individuals; yet, strictly, since we can continue the division so long as there is any difference, however minute, it would be difficult to find a species which could not be subdivided into lower species. We reach the lowest species, then, when practically we do not care to discriminate more minutely, nor to carry our subdivisions farther, though, strictly, the *infima species* has no existence except in speculation.

For the purposes of *Psychology*, every class containing sub-classes is regarded as a genus of which the sub-classes are the species; hence, the same class may be both a genus and a species; it is a genus in regard to the classes contained under it, and it is a species in reference to the class under which it is contained. But, for the purposes of *Natural Science*, the degree of subordination in the series is designated by a name. Thus, *Linnæus* introduced five grades of subordination — class, order, genus, species, variety. With the progress of science, intermediate and additional grades have been introduced. The Botanical Congress held at Paris in August, 1867, recognized twenty-one grades — kingdom, division, subdivision, class, sub-class, cohort, sub-cohort, order, sub-order, tribe, sub-tribe, genus, sub-genus, section, sub-section, species, sub-species, variety, sub-variety, variation, sub-variation. Even this list is probably not complete. The important thing to be observed is the order of the subdivision; but the degree of importance assigned to any grade varies with the opinion of different minds.

A *definition* is such a description of a thing as will distinguish it from all other things. A thing is defined by referring it to the class immediately containing it, and distinguishing it from other things of the class by means of its characteristics. Thus, a triangle is a polygon of three sides.

A *property* of a class is an attribute which belongs to every object of the class, though it does not enter into the definition, since it may belong also to other classes. Thus, it is a property of a rectangle that its angles are equal, but this is also true of any regular polygon.

A *generic* property is one which is common to all the species of a genus. Thus, the sum of the three angles of every plane triangle is equal to two right angles.

A *specific* property is a property which is common to all the individuals of a species. Thus, two angles are equal in every isosceles triangle.

A *peculiar* property of a class is a property which is not found in any object of any other class. Thus, it is a peculiar property of the circle that, for a given perimeter, it contains the maximum area.

A *constant* property is a property which is always and every-where the same. Thus, inertia is a constant property of matter.

A *variable* property is a property subject to change in degree. Thus, density, elasticity, etc., are variable properties of matter.

An *accident* is a quality which may or may not belong to certain objects. Thus, the magnitude of a body is an accident.

Denomination embraces nomenclature and terminology.

*Nomenclature* is the collection of the names of the classes in a science. The number of natural groups is, however, so large that it is impracticable to devise or to remember names for all of them. Thus, the number

of known species of plants is at least 60,000, to say nothing of the sub-species, varieties, and sub-varieties. Some artifice is, therefore, requisite to secure a practical nomenclature. In Botany, the higher groups, down to genera, have distinct names; but the species take the name of the genus modified by that of some attribute, as *geranium sanguineum*. In Chemistry, we have an example of a nomenclature in which the prefixes and suffixes used in names are significant of the nature of the substance, as perchloric acid.

*Terminology* is the collection of the names of the parts and properties of individual objects in the province of a science. Thus, included in the terminology of Botany, are the names *calyx*, *corolla*, etc., expressive of parts of plants; also the names, *pinnatifid*, *palmatifid*, etc., expressive of the shape of the leaf.

## CHAPTER III.

### CLASSIFICATION AND CONCEPTION.

**Classification** is the formation of groups of objects having common qualities. It embraces both generalization and division.

*Generalization* is the formation of classes from objects having common attributes. It embraces both synthetic specification and generification.

*Synthetic specification* is the formation of species from resembling individuals.

Let $A$, $B$, $C$, be individual objects having the common attributes, $a$, $b$, $c$, $d$, $e$, $f$, found by examination and comparison,—$A$ having the additional attributes, $g$, $h$, peculiar to itself; and $B$ and $C$, respectively, the additional attributes, $i$, $j$, and $j$, $k$.

Disregarding the attributes not common to $A$, $B$, $C$, and abstracting and combining the common attributes giving them special prominence, we attribute to them a kind of separate existence, objectively fictitious, though subjectively real, and thus form the concept, which we shall call $C'$, of the class, which we shall call $X$, embracing the individuals, $A$, $B$, $C$, having the common attributes, $a$, $b$, $c$, $d$, $e$, $f$.

In the concept $C'$, no attribute can enter which is not common to all the objects of the class; hence, all the attributes peculiar to an individual, or common to any number of individuals, less than the whole number, must be excluded.

The concept, in its pure form, can not be represented

by the imagination; yet it can be represented, with individual attributes, in a concrete form, by calling up one or more of the individuals, *A*, *B*, *C*. But in calling up an individual, we introduce qualities peculiar to the individual, as well as the qualities common to all the individuals of the class, though we banish, as completely as possible, the qualities peculiar to the individual, and give to the common qualities special prominence.

The image thus obtained is individual; but it has a potential universality in the fact that we may vary it so as to represent any individual of the class, by dropping the peculiarities of one individual and incorporating those of another. But if we drop the peculiarities of one individual without incorporating those of another, the image itself would vanish. In attempting, for example, to represent, by the imagination, the concept of the class horse, we should call up the image of a horse of a particular color, form, size, etc., introducing not only the qualities common to all horses, but also those peculiar to some of the individuals of the class. We thus have an image of an individual, real or imaginary, but not the concept of the class. If we should drop all attributes not belonging to the concept, the image itself would vanish, since we could not construct the image, unless we assign to it some particular color, form, size, etc. Hence, a concept, in its pure generality, can not be represented by the imagination.

On the other hand, if we should drop from the image all that is characteristic of the class horse, retaining, at the same time, the other elements, it would no longer be recognized as the image of a horse, but it would still have the elements common to animal, or, dropping these, the elements common to organic being, then the element common to being, dropping this, the image would vanish. Hence, every image must contain both particular and

universal elements, and will vanish whenever either kind is dropped. The universal and the particular are, therefore, not two kinds of ideas, but the two elements of every idea. An idea that is exclusively general or exclusively particular can not be realized, but can only be approached by directing the attention especially to the one kind of elements or the other. The common element that enters into every cognition is that of being; but with this, there is also always present, the subjective intuition of the conditional necessity of the ego, as the subject of the cognition.

Though the general concept can not be represented, as a pure universal, by the imagination, yet it is possible to represent the class as a collection of individuals. Thus, the class denoted by $X$ is the collection of the individuals, $A$, $B$, $C$, and as such, it is capable of representation. A class consisting of a vast multitude, as the class *man*, can not be represented in its totality, since great multitudes of individuals are unknown. Thus, many human beings have died, many are not yet born, yet such a number and variety can be represented, as will do fair justice to the entire class.

We have formed the individuals $A$, $B$, $C$, having the common attributes, $a$, $b$, $c$, $d$, $e$, $f$, into the class $X$, of which the concept $C'$, is the combination, $abcdef$ of these common attributes.

Now, let $L$, $M$, $N$, be individuals having the common attributes, $b$, $c$, $f$, $l$, $m$, $n$,—$L$ having the additional attributes, $t$, $u$, peculiar to itself; and $M$ and $N$, respectively, the additional attributes, $v$, $w$, and $w$, $x$. We thus form the concept $C''$, of the class which we shall call Y, containing the objects $L$, $M$, $N$, having the common attributes, $b$, $c$, $f$, $l$, $m$, $n$.

*Generification* is the formation of higher classes from species. These classes are called *genera* (sing. *genus*).

Taking the results obtained under synthetic specification, denoting the sum of the attributes by the proper letters, without the sign of addition, and writing the attributes of the individuals, and the concepts of the classes, as subscripts, we have

$$\left.\begin{matrix} A_{abcdefgh} \\ B_{abcdefij} \\ C_{abcdefjk} \end{matrix}\right\} = X_{abcdef} = C'$$

$$\left.\begin{matrix} L_{bcflmntu} \\ M_{bcflmnvw} \\ N_{bcflmnwx} \end{matrix}\right\} = Y_{bcflmn} = C''$$

The expression, $A_{bcdefgh}$, is read the individual $A$, whose attributes are $a, b, c, d, e, f, g$; and $X_{abcdef} = C'$ is read the class $X$, whose concept, $abcdef$, equals $C'$.

Now, if we wish, by a higher generalization, to form a higher class containing the classes $X$ and $Y$, we disregard the attributes $a, d, e$, peculiar to the concept, $C'$, of the class $X$, also the attributes, $l, m, n$, peculiar to the concept, $C''$, of the class $Y$, and, by abstracting and combining the attributes, $b, c, f$, common to $C'$ and $C''$, we form the concept, $C'''$, of the genus which we shall call $Z$, embracing the classes, $X$ and $Y$, as species.

The process of generification is thus exhibited:

$$\left.\begin{matrix} X_{abcdef} = C' \\ Y_{bcflmn} = C'' \end{matrix}\right\} = Z_{bcf} = C'''$$

In like manner, having formed another genus containing attributes in common with $Z$, we form a still higher genus, and so on.

*Division* is the resolution of a class into sub-classes or individuals. Comparing the objects embraced in $Z$, we find, not only that they possess the attributes, $b, c, f$, in

common, but that some of them possess the attributes, *a*, *d*, *e*, not possessed by the remaining objects of the class, and that the remaining objects possess the attributes, *l*, *m*, *n*, not possessed by the first. We disregard the attributes, *b*, *c*, *f*, common to all the objects of the genus *Z*, and direct attention to the attributes, *a*, *d*, *e*, and *l*, *m*, *n*, respectively common to the two parts of the genus *X*. Either of the groups of attributes, *a*, *d*, *e*, and *l*, *m*, *n*, is sufficient to divide the genus into two species, one containing the group of attributes under consideration, and the other not containing this group. We may, if we choose, take both groups into consideration in the division. We then divide the genus *Z* into the two species, designated, respectively, by *X* and *Y*, which, though containing the attributes, *b*, *c*, *f*, characteristic of the genus, and hence common to *X* and *Y*, are characterized, respectively, by the attributes, *a*, *d*, *e*, and *l*, *m*, *n*.

This division of the genus, *Z*, into the two species, *X* and *Y*, is called *analytic specification*, to distinguish it from *synthetic specification*, in which a species is formed from similar individuals.

In discriminating *X* and *Y*, as species of the genus *Z*, the attributes, *a*, *d*, *e*, and *l*, *m*, *n*, respectively characteristic of *X* and *Y*, are made especially prominent, while the attributes, *b*, *c*, *f*, characteristic of the genus *Z*, and hence common to *X* and *Y*, are obscurely recognized. In generalization, *similarities* play the important part, but *differences* in division. Similarities are detected by *identification*, and differences by *discrimination*.

The discrimination of differences, unchecked by the identification of similarities, would individualize and isolate every thing, and render science impossible; but the identification of similarities leads to generalization, induction, and the comprehensive truths of science.

The division of *X* gives the individuals, *A*, *B*, *C*, each

of which, though containing the attributes, $a$, $d$, $e$, characteristic of $X$, also the attributes, $b$, $c$, $f$, characteristic of $Z$, and hence common to $X$ and $Y$, is especially characterized by attributes peculiar to itself. In like manner, the division of $Y$ gives the individuals, $L$, $M$, $N$, each of which, though containing the attributes, $l$, $m$, $n$, and $b$, $c$, $f$, respectively characteristic of $Y$ and $Z$, is also characterized by attributes peculiar to itself. This process is called *individualization*. The processes of division, including both analytic specification and individualization is thus exhibited:

$$Z_{C''}=bcf \begin{cases} X_{C'}=abcdef \begin{cases} Aabcdefgh \\ Babcdefij \\ Cabcdefjk \end{cases} \\ Y_{C''}=bcflmn \begin{cases} Lbcflmntu \\ Mbcflmnvw \\ Nbcflmnwx \end{cases} \end{cases}$$

Each higher class embraces all the subordinate classes and individuals, and each lower class or individual contains all the attributes of the higher class, together with those attributes peculiar to itself. Hence, the higher the class the greater the number of objects, and the less the number of attributes; and the lower the class the less the number of objects, and the greater the number of attributes.

In generalization, by synthetic specification, we form a species from resembling individuals by a comparison of the individuals; but in generalization by generification, we form a genus from resembling species by a comparison of the concepts of the species.

In division, we find the subdivisions of a class by a comparison of the objects of the class, and not by the analysis of its concept. Hence, in division, we divide

classes, that is, genera and species, not their concepts; for the concept of a class contains fewer attributes than the concepts of its subdivisions, and these concepts contain more attributes as we descend.

The *rules* for the process of division are the following:

1st. Every division should be made in reference to one principle and only one.

2d. The principle of division should be a determinate attribute of one of the members of the class divided.

3d. The principle of division should be selected in view of the objects to be accomplished.

4th. Each member must be less than the class divided.

5th. The sum of the members must be equal to the class divided.

6th. The members must be co-ordinate and mutually exclusive.

7th. The divisions must proceed continuously, each member being immediately subordinate to the class under which it is placed.

*Denomination*, as the naming of individuals, species and genera, constitutes the *nomenclature* of a science; but as the naming of the parts and properties of individuals, it constitutes the *terminology*.

The name of a class *denotes* all the subdivisions of that class, whether species or individuals, and *connotes* their common attributes. In connection with the process of classification, names are usually applied to designate the classes, individuals, or attributes.

The names of classes are subject to two contrary changes, as influenced by generalization or division. In generalization, the name of a species is often *generalized*, or extended to its genus, thus increasing its denotation, and diminishing its connotation. Thus, the name *coal*, which originally denoted charred wood, was extended to a mineral substance resembling it. The new coal, at

first designated as *pit-coal* or *sea-coal*, becoming the more common, is now usually designated simply as *coal*, while the original coal is called *charcoal*. In division, the name of the genus is often *specialized* or restricted to one of its species, thus decreasing its denotation and increasing its connotation. Thus, the name *physician*, originally signifying one who studies nature, now signifies one who applies his knowledge of the human system, to the practice of medicine. One who studies nature is called a *physicist;* and one who studies animate nature is called a *naturalist*.

Though a subordinate act, denomination is yet a matter of great importance, since it embodies the products of thought in verbal signs, and thus affords the requisite facilities for thinking.

A *definition* is such a description of a thing, whether an object or a class, as will distinguish it from all other things. A thing is defined by affirming it to belong to the class immediately containing it, and distinguishing it from other things of that class by means of its essential characteristics. Thus, let $Z$ be the genus embracing the species $X$ and $Y$,—$X$ characterized by $a\ d\ e$, and $Y$ by $l\ m\ n$. Then $X$ is that species of the genus $Z$, which is characterized by $a\ d\ e$. Hence, a definition of a thing gives both its denotation and connotation, otherwise called its extension and comprehension, or sphere and matter, or breadth and depth, or genus and differentia.

A definition should also exhibit the following qualities:

(1) The subject and predicate of a definition are coextensive and interchangeable. Thus, "A rectangle is a right parallelogram," and "A right parallelogram is a rectangle." The proposition, "Horses are four-footed animals," though true, is not a definition, since the predicate is greater in extent than the subject.

(2) A definition should not be circular; that is, the predicate should not contain the name of the thing defined, nor any derivative of that name, nor any term whose definition involves that name. Thus, the following definitions are circular: "Law is a lawful command." "Mathematics is the science of quantity," and "Quantity is the object of mathematical investigation."

(3) A definition should be clear and precise. Thus, Dr. Johnson's definition, "Net-work is any thing decussated or reticulated, with interstices between the intersections," is not clear. "Parallel lines are those which never meet," wants precision, since it is defective, as parallel lines also lie in the same plane. "Parallelograms are quadrilaterals whose opposite sides are parallel and equal," wants precision, since it is redundant. The words "and equal" should be omitted.

(4) A definition should be affirmative rather than negative. Thus, "Industry is not honesty," does not tell what industry is, but what it is not. A negative definition is, however, allowable when a positive one can not be given.

(5) A definition admits of no exception. For an exception would invalidate the definition.

A *genetic* definition is one which exhibits the mode of producing the thing defined. Thus, a sphere is a solid generated by the revolution of a circle about a diameter.

## CHAPTER IV.

### CLASSIFICATION AND CONCEPTION.

**1. Names.**—A *name* is the verbal designation of a class or an individual, or of a part or an attribute of an individual.

Species and genera uniformly receive names, also individuals in cases of importance, as human beings, certain domestic animals, geographical objects, etc.; but in other cases, individuals are not named, otherwise than by the common name of the class to which they belong. In fact, it would be impossible to name every individual, as in case of plants, leaves, birds, fishes, insects, etc.

The parts and qualities of individuals are named in the terminology of the sciences, though the individuals themselves are not designated by proper names. But the names of parts and qualities of individuals are common nouns, and apply to the similar parts of resembling individuals.

Names, as originally applied, were expressive of some quality of the objects named, and the same names were afterwards applied to other objects possessing similar qualities, thus aiding classification. As knowledge advances, other qualities are discovered in the objects of a class, perhaps more important and fundamental than that signified by the name, but the name is not usually changed, though its signification varies. Hence, a concept may be variable, while the name and the class as inclusive of all its subordinates, known or unknown, actual or possible, may be constant.

The variability of a concept, however, differs greatly from the variability of the image of an individual; for the variability of the image is a consequence of the variable character of its peculiar elements, since these may so change that the image may represent, in rapid succession, many different individuals of the class; but the variability of the concept is a consequence of a change in our opinion as to what is essential to the class, and this change is usually of slow growth. With the exception of the change growing out of maturer views, a concept is practically invariable.

A name *denotes* the objects of a class, and *connotes* their attributes. But what attributes are connoted? Strictly and scientifically, the name should connote only essential attributes,— those conceived as constituting the concept of the class; but the concept is, as we have seen, variable for the same mind, and differs for different minds, and is always represented in connection with the peculiarities of an individual. A name, then, practically connotes all the attributes, essential and accidental, which it calls up to the individual mind. Hence, the connotation of a name may be variable, while its denotation may be constant.

The expression, *constant denotation*, needs qualification. Thus, the words *Chinese railway* may, in the year 1882, denote, in our thought, the one short railway in China; but, virtually, it denotes all the railways that shall ever be constructed in the Celestial Empire. Likewise, the name *man* denotes not only living human beings, but also those of past and future generations. The extent which a term denotes to an individual mind, varies with its knowledge.

In consequence of the variability in the connotation of common names, technical terms are employed in science, which shall not only denote the objects of the

respective classes, but also connote exclusively their essential attributes. Though a common name or a technical term, denotes all the objects of the class designated by it, yet the mind, when employing either, does not actually represent in memory all the objects of the class; for a multitude of these objects are wholly unknown, and others, though once known, are now, perhaps, altogether forgotten.

**2. Nature of classes and concepts.**— What is the nature of classes,—the species and genera, and their relation to their concepts? What is the object of thought when we employ a common noun, as *man* or *horse?* Three theories have been proposed in answer to these questions — Realism, Nominalism, and Conceptualism.

1st. *Realism*, not as opposed to Idealism in Perception, but to Nominalism and Conceptualism in Conception, is the doctrine that a species or a genus has a real objective existence, independent, both of the individual objects of the class, and of the act of conception; that it embraces the elements common to all the individuals of the class; that it is the object of which the concept is the counterpart; and that it is the perfect pattern according to which the individuals of the class are fashioned, and in comparison with which they must forever remain imperfect and inferior. This is the doctrine of Plato, as understood by Aristotle. The formula, as afterwards given, is *universalia ante rem.* In this extreme form, Realism has long since been exploded.

A modified realism, is, however, possible. A universal is not a kind of being or kind of idea, but an element of both being and idea, the other element being particular; but the universal, apart from the particular, can neither exist nor be represented. But if we regard a species as a collection of resembling individuals, and a genus as a collection of resembling species, then both

species and genera have an objective existence, independent, not of the objects, but in a certain sense, of the human mind, which has only discovered the classes existing in nature. The formula of modified realism is, *universalia in re.*

Both nature and the human mind perform their part in classification. In some cases, nature performs the more conspicuous part, leaving to the human mind the easy part of recognizing obvious resemblances and differences. This is especially true of the organic kingdoms. In other cases, the classes appear to be the creations of the human mind; but the resemblances, though occult to the common observer, are still in nature, and, as natural distinctions, are recognized by the eye of science.

Since an individual can be represented by the imagination, a species, as a collection of individuals, can be represented, though imperfectly, since but a portion of the individuals will, in general, be represented; yet a sufficient number and variety of specimens may be chosen as fairly to represent the class. In like manner a genus, as a collection of species, can be represented.

2d. *Nominalism* is the doctrine that only individuals have a real existence; that all our ideas are particular; that universals exist only as names of resembling individuals; that the concept, in its pure generality, can not be represented by the imagination; that only the individual can be represented; that the idea of an individual has a potential universality by which it can be made to represent any individual of the class, by dropping the peculiarities of one individual and incorporating those of another; and that, as soon as all peculiarities are dropped, the idea itself will vanish. The formula for Nominalism is, *universalia post rem.*

The *name* man, for example, is applicable to every individual of the class, and in this sense is universal.

The *class* man embraces the various races,—white, black, red, yellow, and copper colored, divided into nationalities, ranks, and individuals, of past, present, and future generations, with all their peculiarities. The *concept* man, in its pure generality, embraces those elements, and those only, which are common to all the individuals of the class.

Now, can the concept man be represented by the imagination? Let us try to represent it. On trial, we find that the image which we form is, in every instance, an idea of an individual, actual or imaginary, having a certain size, form, color, and other peculiarities, but the image is not the concept of the class. This image has, however, a potential universality, since it can be varied by dropping the peculiarities of one individual and incorporating those of another, and so on, so as to make it represent any other individual of the class; but as soon as we drop all peculiarities, the image itself vanishes, since we can not have an image which does not exhibit some definite size, form, color, etc.

3d. *Conceptualism* is the theory that a universal has an existence in the mind of the thinking subject, as a pure concept embracing those elements only which are common to all the individuals of the class; that it is formed by comparing resembling individuals, disregarding their peculiarities, and abstracting and combining their common qualities; and that, after it has once been formed from a comparison of resembling individuals, it can be reproduced without reference to these individuals, though it may be predicated of any of them.

If the pure concept can not, as we have shown in discussing Nominalism, be represented by the imagination, what kind of an existence has it, and how can it be distinguished from an image of an individual? To illustrate, take the idea of an individual of a class, and

vary it by dropping the peculiarities of that individual and incorporating those of another, and so on, till the idea has represented, in succession, at least a considerable number of the objects of the class. Now, in this varying idea, we have two classes of elements — variables and constants. The variable elements form no part of the concept, though some one or more of them are necessary to the idea of a specified individual. The constant elements can be ascertained as those which enter the idea formed of every individual of the class, and these elements alone, taken together, constitute the pure concept, which is, therefore, not zero to thought, though it is zero to the imagination, since it vanishes whenever all variable elements are dropped.

The idea of an individual embraces the constant common elements of the concept, plus the variable peculiarities of the individual.

In assigning an individual to its class, the common elements of the concept are especially considered; but, in identifying an individual, the peculiarities which distinguish the individual receive the chief attention.

The error of Realism is the assumption that the universal has an objective existence, apart from the particular.

The error of Nominalism is the assumption that an idea can be merely particular, and that the only thing universal is the name.

The error of Conceptualism is the assumption that an idea can be merely general.

These errors have their origin in the common assumption that the universal and the particular, which are elements, both of things and of ideas, are either kinds of things or kinds of ideas.

The following *Propositions concerning Universals* was contributed by *Mr. B. A. Hinsdale.*

1. **Metaphysical Universals.**—These are architypical forms in the Divine mind. They are the patterns according to which God wrought in the creation, and may be said to correspond to the "ideas" of Plato. In this sense, universals are *before* things: *universalia ante rem.*

2. **Natural Universals.**—These are the common natures belonging to different species, as rationality belongs to men. In this sense, universals are *in* things: *universalia in re.*

3. **Logical Universals.**—These are general notions or concepts framed by the human mind; they are based on the common natures possessed by the species. In this sense universals are *after* things: *universalia post rem.*

4. **Universal terms or names.**—These stand for logical universals; they are both after things and after concepts.

See the *Krauth-Fleming Vocabulary.*

From these four propositions certain others flow.

1st. There are such things as species.

2d. These species existed in ideas *before* things; they exist in substance *in* things; they exist in concepts and names *after* things.

3d. The extreme Realist is right in the sense of the first proposition; the moderate Realist in the sense of the second; the Conceptualist is right in emphasizing the subjective nature of the concept; and the extreme Nominalist wrong in holding that names are the only universals.

## CHAPTER V.

### CLASSIFICATION AND CONCEPTION.

**In classification,** does the mind first ascend by generalization, from individuals to species, and from species to genera, then descend, by division, from genera to species, and from species to individuals, or does it proceed in a reverse order, that is, first descend, and then ascend? In the formation of language, in its acquisition by children, do proper nouns precede common, or do common nouns precede proper?

Three theories have been proposed by philosophers in their attempts to answer these questions:

1st. *Particulars are before generals, and proper nouns are before common.* This view is held by Vives, Locke, Rousseau, Condillac, Adam Smith, and others. Hamilton translates from Vives thus: "The order of learning is from the senses to the imagination, and from this to the intellect;—such is the order of life and of nature. We thus proceed from the simple to the complex, from the singular to the universal. This is to be observed in children, who first express the several parts of different things, and then conjoin them. Things general they call by singular names; for instance, they call all smiths by the name of that individual *smith* whom they have first known, and all meats, *beef* or *pork*, as they have happened to have heard the one or the other first, when they began to speak. Thereafter, the mind collects universals from particulars, and then again reverts to particulars from universals." *Metaphysics*, page 493.

Locke expresses the same opinion in nearly the same words as those used by Vives.

Adam Smith says: "The assignation of particular names to denote particular objects,—that is, the institution of nouns substantive, would probably be one of the first steps towards the formation of language. Two savages, who had never been taught to speak, but had been bred up remote from the societies of men, would naturally begin to form that language by which they would endeavor to make their mutual wants intelligible to each other, by uttering certain sounds whenever they meant to denote certain objects. Those objects only which were most familiar to them, and which they had most frequent occasion to mention, would have particular names assigned to them. The particular cave whose covering sheltered them from the weather, the particular tree whose fruit relieved their hunger, the particular fountain whose water allayed their thirst, would first be denominated by the words *cave*, *tree*, *fountain*, or by whatever appellations they might think proper, in that primitive jargon, to mark them.

"Afterwards, when the more enlarged experience of these savages had led them to observe, and their necessary occasions obliged them to make mention of other caves and other trees and other fountains, they would naturally bestow upon each of these new objects the same name by which they had been accustomed to express the similar object they were first acquainted with. The new objects had none of them any name of its own, but each of them exactly resembled another object which had such an appellation. It was impossible that those savages could behold the new objects without recollecting the old ones, and the names of the old ones to which the new bore so close a resemblance. When they had occasion, therefore, to mention or to point out to each other any of the new

objects, they would naturally utter the name of the correspondent old one, of which the idea could not fail, at that instant, to present itself to their memory in the strongest and liveliest manner. And thus those words which were originally the proper names of individuals, would each of them insensibly become the common name of a multitude.

"A child that is just learning to speak, calls every person who comes to the house its papa or its mamma; and thus bestows upon the whole species those names which it had been taught to apply to two individuals. . . .

"We say of a hero, that he is an Alexander; of an orator, that he is a Cicero; of a philosopher, that he is a Newton. This way of speaking demonstrates how much all mankind are naturally disposed to give to one object the name of any other which nearly resembles it, and thus to denominate a multitude by what originally was intended to express an individual.

"It is this application of the name of an individual to a great multitude of objects whose resemblance naturally recalls the idea of that individual, and the name which expresses it, that seems originally to have given occasion to the formation of those classes and assortments which, in the schools, are called genera and species." *Theory of Moral Sentiments — Appendix.*

2d. *Generals are before particulars and common nouns before proper.* This view was held by many of the schoolmen, by Leibnitz, Turgot, and others. Leibnitz says: "General terms serve not only for the perfection of languages, but are even necessary for their essential constitution. For, if by *particulars* be understood things individual, it would be impossible to speak if there were only proper names and no appellatives; that is to say, if there were only names for things individual, since, at every moment, we are met by new ones, when we

treat of persons, of accidents, and especially of actions, which are those that we describe the most; but if by particulars be meant the lowest species, besides that it is frequently very difficult to determine them, it is manifest that these are already universals founded on similarity.

"Now, as the only difference of species and genera lies in a similarity of greater or less extent, it is natural to note every kind of similarity or agreement, and consequently to employ general terms of every degree; nay, the most general being less complex with regard to the essences which they comprehend, although more extensive in relation to the things individual to which they apply, are frequently the easiest to form, and are the most useful.

"It is likewise seen that children, and those who know but little of the language which they attempt to speak, or little of the subject on which they would employ it, make use of general terms, as *thing*, *plant*, *animal*, instead of using proper names of which they are destitute. . . . .

"I would add, in conformity to what I have previously observed, that proper names have been originally appellative, that is to say, general in their origin, as Brutus, Cæsar, Augustus, Cicero, Alps, etc. . . . .

"Thus, I would make bold to affirm that almost all words have been originally general terms, because it would happen very rarely that men would invent a name, expressly and without reason, to denote this or that individual. We may, therefore, assert that the names of individual things were names of species, which were given *par excellence*, or otherwise, to some individual. . . . .

"It is thus, likewise, that men give the names of genera to species, that is to say, that they content themselves with a term more general or vague to denote more particu-

lar classes, when they do not care about differences." *Nouveaux Essais*, Lib. iii. Ch. i., page 297.

3d. *Either order is followed indifferently.* Hamilton says: "Here are two opposite opinions, having nearly equal authority in their favor, maintained, on both sides, with equal ability and apparent evidence. Either doctrine would be held established were we unacquainted with the arguments in favor of the other. . . . .

"But I have now to state to you a third opinion intermediate between these, which conciliates both, and seems, moreover, to carry a superior probability in its statement. This opinion maintains, that as our knowledge proceeds from the confused to the distinct,—from the vague to the determinate,—so, in the mouths of children, language at first expresses neither the precisely general, nor the determinately individual, but the vague and confused; and that, out of this, the universal is elaborated by generification, the particular and singular by specification and individualization. . . . .

"Instead of commencing with minima, perception commences with masses. Though our capacity of attention be very limited in regard to the number of objects on which a faculty can be simultaneously directed, yet these objects may be large or small. We may make, for example, a single object of attention, either of a whole man, or of his face, or of his eye, or of the pupil of his eye, or of a speck upon the pupil. To each of these objects there can only be a certain amount of attentive perception applied, and we can concentrate it all on any one.

"In proportion as the object is larger and more complex, our attention can, of course, be less applied to any part of it, and consequently, our knowledge of it, in detail, will be vaguer and more imperfect. But, having first acquired a comprehensive knowledge of it, as a

whole, we can descend to its several parts, consider these, both in themselves and in relation to each other, and to the whole of which they are constituents, and thus attain to a complete and articulate knowledge of the objects. We decompose, and then we recompose. . . .

"I say, then, that the first procedure of mind, in the elaboration of its knowledge, is always analytical. It descends from the whole to the parts,—from the vague to the definite. Definitude, that is, a knowledge of minute differences, is not, as the opposite theory supposes, the first, but the last term of our cognitions. Between two sheep, an ordinary spectator can probably apprehend no difference, and if they were twice presented to him, he would be unable to discriminate the one from the other. But a shepherd can distinguish every individual sheep; and why? Because he has descended from the vague knowledge which makes every sheep, as it were, only a repetition of the same undifferenced unit,—to a definite knowledge of qualities by which each is contrasted from its neighbor. Now, in this example, we apprehend the sheep by marks not less individual than those by which the shepherd discriminates them; but the whole of each sheep being made an object, the marks by which we know it are the same in each and all, and can not, therefore, afford the principle by which we can discriminate them from each other.

"Now, this is what appears to me to take place with children. They first know,—they first cognize the things and persons presented to them, as wholes. But wholes of the same kind, if we do not descend to their parts, afford us no difference,—no mark by which we can discriminate the one from the other. Children, thus originally perceiving similar objects,—persons, for example,—only as wholes, do at first hardly distinguish them. They apprehend first the more obtrusive marks that

separate species from species, and in consequence of the notorious contrast of dress, men from women; but they do not as yet recognize the finer traits that discriminate individual from individual.

"But though thus apprehending individuals only by what we now call their specific or their generic qualities, it is not to be supposed that children know them by any abstract, general attributes, that is, by attributes formed by comparison and attention. On the other hand, because their knowledge is not general, it is not to be supposed to be particular or individual, if by particular be meant a separation of species from species, and by individual, the separation of individual from individual; for children are apt to confound individuals together, not only in name, but in reality." Page 497.

It may be remarked, on account of its bearing on education, that though the order of procedure is, in general, the collection of facts, the classification of facts, and the reasoning on the facts, yet we are not to refrain from classifying till we have collected all possible facts relating to all possible subjects, or from reasoning till we have made all possible classifications. As soon as we have collected the facts pertaining to a special subject, we can classify, and as soon as we classify, we can reason.

It is true that in a particular investigation the order of thought is first acquisition, then representation, then elaboration; yet it is not true that the perceptive faculties should first be educated, then the representative, then the elaborative. These faculties ought to be educated together. Children not only perceive, but imagine and reason.

## CHAPTER VI.

### QUANTITY OF CONCEPTS.

**The quantity** of a concept is of two kinds—*comprehensive*, when referring to the number of common qualities of a class, thus corresponding to the connotation of the name, and *extensive*, when referring to the number of subdivisions of the class, thus corresponding to the denotation of the name. Thus, the quantity of a concept emerges, when the concept is viewed with reference to its *objects*—that is, to its content, or common qualities involved, and to its extent, or the subdivisions of the class.

1st. *The comprehension of concepts.* The comprehension of a concept is that kind of quantity which is expressed by the number of qualities, attributes, or characteristics, as they are variously called, of which the concept is the sum. It is also called its content, matter, depth, or internal or intensive quantity. In reference to its comprehension, a concept is, therefore, regarded as a whole of which the constituent parts, or elements, are the common qualities of resembling individuals or classes.

The comprehension of the concept of a class is primarily known in the act of its formation, that is, in comparing all the objects of a class, or a sufficient number of them, and ascertaining and combining their common qualities. It is secondarily known by analysis, that is, by resolving the concept into its constituent elements. Thus, the concept *man* is found to comprehend the elements connoted by the words rational and animal, the

word *rational* connoting the faculties of rational intuition, conceiving, judging, and reasoning, and the word *animal* connoting the common qualities possessed by living sensitive beings. The concept man immediately comprehending the concepts rational and animal, mediately comprehends all their parts, and the parts of these parts, and so on, till we reach simple elements.

Generalization — or the formation of a class of individuals or of species, and the formation of the concept of the class — implies an analysis of the comprehension of the concepts of the individuals or of the species, a comparison of their elements, noting, abstracting, and combining those that are common.

2d. *The extension of concepts.* The extension of a concept is that kind of quantity which is expressed by the number of individuals or classes which have, as common qualities, the qualities involved in the concept. It is also called its extent, sphere, breadth, or external or extensive quantity. The extension of a concept is, therefore, the class, regarded as a whole, of which the parts are the subordinate classes or individuals having, as common qualities, the qualities involved in the concept.

The extension of a concept is primarily known in the act of generalization by which individuals are formed into classes, and these classes into higher classes. It is secondarily known by division, that is, by resolving a class into its subdivisions, and these subdivisions into others, and so on, down to individuals. But the division of a class implies the analysis of the contents of the parts of its extent, noting that one part contains qualities not found in the other parts, and dividing in view of this fact. Thus, by examining triangles, and analyzing their content, we shall find that some of them have a right angle, while others have not; but those not right are oblique; hence, triangles are divided into right tri-

angles and oblique triangles. This division gives a dichotomy, of which the two parts are contradictories, since they are mutually repugnant, and together universally inclusive of all triangles. But should we divide triangles into right triangles, acute triangles, and obtuse triangles, we should have a trichotomy, whose members are contraries, since they are mutually repugnant, but no two of them universally inclusive.

The definition of a species refers it to its genus, and characterizes it by its content, and hence determines its extent and distinguishes it from the other species of the genus.

Analysis gives content; division, extent; and definition, both content and extent.

The comprehension of a concept can not be represented by the imagination, apart from the extension, nor the extension apart from the comprehension; but the class can be represented, as having both comprehension and extension, as found in the realities of nature.

3d. *Relation of the comprehension and the extension of concepts.*

(1) The comprehension of a concept varies inversely as its extension, that is, the greater the extent the less the content, and conversely; for the higher the genus, the greater the extension, and the less the comprehension; and the lower the species, the less the extension and the greater the comprehension. Thus, the comprehension of the concept animal is less than that of the concept horse, since it contains those attributes only which are common to all the subordinate species, whereas the concept horse contains all the attributes common to all these species, and to all the species of the genus containing horse, together with what is characteristic of itself. But the extension of the concept animal is greater than that of the concept horse, since it contains the class

horse, as a subdivision, together with a great variety of other subdivisions.

(2) The simple concept *being* is a *minimum* as to comprehension and a maximum as to extension. It is a minimum as to comprehension, since it contains in it no essential attribute which is not an attribute of every class, sub-class, and individual contained under it, and the only attribute thus common is existence. It is a maximum as to extension; for, since *being* is the highest genus, it contains under it all other classes, subclasses, and individuals. It is, therefore, extensive rather than comprehensive.

(3) The class *being* is incapable of definition, the comprehension of its concept is incapable of analysis, but the extension is capable of division. The class is incapable of definition, since it is not contained under a higher genus, neither has it a differential attribute. The comprehension of its concept is incapable of analysis, since it contains but one element—existence. The extension of its concept is capable of division, since by an analysis of the comprehension of the parts of the extension, they are found to possess qualities peculiar to each; hence, the class *being* can be resolved into classes, subclasses, and so on, down to individuals.

(4) An individual concept is a maximum as to comprehension and a minimum as to extension. It is a maximum as to comprehension, since it contains all the attributes common to all the individuals of its class, together with what is peculiar to itself. It is a minimum as to extension, since it contains no classes or individuals under it. It is, therefore, comprehensive rather than extensive.

(5) An individual is capable of definition, the comprehension of its concept is capable of analysis, but the extension is incapable of division. An individual is ca-

pable of definition, since it is contained under a class, and has peculiar qualities. The comprehension of its concept is capable of analysis, since it involves a plurality of attributes. The extension of its concept is incapable of division, since it contains neither classes nor individuals under it.

(6) A concept neither simple nor individual is neither a maximum nor a minimum, either as to comprehension or to extension. Since it is neither the highest genus nor an individual, it is neither a maximum nor a minimum as to comprehension; for, the lower the species, the greater the comprehension, down to the individuals, and the higher the genus, the less the comprehension, up to the highest genus. For like reason, it is neither a maximum nor a minimum as to extension; for the higher the genus, the greater the extension, up to the highest genus, and the lower the species, the less the extension, down to the individuals.

(7) A class, not the highest genus, is capable of definition, the comprehension of its concept is capable of analysis, and the extension is capable of division. The class is capable of definition, since it is contained under a higher class, and has characteristic qualities. The comprehension of its concept is capable of analysis, since it involves a plurality of attributes, and the extension is capable of division, since the class contains other classes or individuals under it.

It will be observed that a class may be defined unless it is the highest genus; that an individual may be defined; that a concept is identified by naming the class of which it is the concept; that the comprehension of a concept is analyzed but not divided; that the extension of a concept is divided but not analyzed; that the comprehension of the concept *being*, does not admit of analysis, though its extension admits of division; that the

extension of the concept of an individual does not admit of division, though its comprehension admits of analysis; that the class being contains but one universal attribute —*existence*, though all actual attributes are contained in its parts; and that being is divided by analyzing the contents of its parts.

In rising, by generalization, from individuals to species, we abstract our thoughts from the peculiarities of the individuals, and overlook their idiosyncrasies. Thus, the concept of the species is less rich in attributes than the idea of the individual. In like manner, in rising from species to genera, and from these to still higher genera, the ascending hierarchy of concepts become more and more meager in content, till we reach that of being, which is characterized by no attribute but that of existence. Thus, the higher we rise, the greater the poverty of our concepts in content, till they terminate in the minimum of knowledge, if not in utter nescience.

There are two remedies for this undesirable result:

(1) The tendencies of abstraction and generalization are counteracted by those of division and discrimination. As we may rise higher and higher, and thus drop attributes continually, so we may descend deeper and deeper, and thus multiply attributes indefinitely. Though, as we ascend towards the summit, the general concepts of the higher classes necessarily contain fewer and fewer elements, yet the classes themselves contain, not as universally diffused, but somewhere in their subdivisions, every actual attribute. As we rise, though we drop the elements not common from the contents of the general concept, yet we retain them as elements of parts of the extent. Thus being, though indeed containing but one universal attribute, that of existence, contains in its subdivisions all attributes, and thus the division of being, not of the concept, but of the class, gives all reality.

(2) The intuition of reason declares the necessity of the conditions of whatever exists, thus giving to every thing its explanation and law, and uniting all realities by their common dependence on the Absolute First Cause.

4th. *Other forms of quantity.* In addition to the two forms of quantity, the comprehension and extension of concepts, called the *logical wholes*, there are other wholes of which the following are specimens:

(1) *The dianoetic whole—the whole of thought.* Every thing has its negation, and the two comprise the universe,—thus *B* and non-*B*. Then, we can say, *A* is *B* or non-*B*.

(2) *The mathematical whole—the whole of necessary form.* Of this species, there are two varieties: *The arithmetical whole*, as a collection of objects, involving time in their reckoning. *The geometric whole*, as a cubic foot of wood, a barrel of water. This is a mass whole, and space is involved.

(3) *The essential whole—the whole of being.* Of this species there are two varieties: *The substantial whole*—the substance with its attributes. *The causal whole*—the cause and its effects. The substantial whole and the causal whole are the complementary parts of the essential whole.

(4) *The corporate whole—the formal* or æsthetic whole. This is the idea revealed in the matter by the form.

(5) *The accidental whole—the whole by accident.* Of this species there are three varieties—*Of degree*, as mankind comprises the rich and the poor. *Of position*, as the upper and the lower, the right and the left, etc. *Of affinity*, as the family comprises the parent and the children.

## CHAPTER VII.

### QUALITY OF CONCEPTS.

**The Quality** of a concept has relation to the subject mind, and is chiefly found in the pairs of opposites—clearness and obscurity, distinctness and indistinctness.

1st. *Clearness and obscurity.* A concept is *clear* when it is discriminated, as a whole, from other concepts. A concept is *obscure*, when it is confounded with other concepts. Clearness is attained and obscurity avoided by definition of the class.

The degree of clearness or obscurity of a concept is variable. Perfect clearness, obviating all confusion, is a possible, though a rare attainment. Total obscurity, obliterating all distinction, would, when reached, cause the concept itself to vanish. The degree of obscurity, therefore, varies between the limits, perfect clearness and total obscurity. A concept is characterized as clear or obscure, according to its prevailing quality.

2d. *Distinctness and indistinctness.* Distinctness and indistinctness have two varieties — comprehensive and extensive. A concept has comprehensive or extensive distinctness or indistinctness, according as the attributes involved in its content, or the subdivisions embraced by its extent, are discriminated or confounded. Comprehensive distinctness is attained, and comprehensive indistinctness is avoided, by analysis. Extensive distinctness is attained, and extensive indistinctness is avoided, by division.

The degree of distinctness, in general, varies between

the limits perfect distinctness and complete indistinctness. A concept is characterized as distinct or indistinct, according to its prevailing quality.

A concept may be clear, that is, be discriminated, as a whole, from other concepts, and yet be more or less indistinct. Thus, our concept of the genus animal may be clear, and still be far from having either comprehensive or extensive distinctness; but a concept having both comprehensive and extensive distinctness, has also the quality of clearness. Distinctness is, therefore, a higher virtue than clearness, and its attainment is a higher achievement.

3d. *Concepts admitting of distinctness.* Since comprehensive distinctness signifies a clear apprehension and discrimination of the attributes involved in the content of a concept, and extensive distinctness, a clear apprehension and discrimination of the classes and individuals embraced in the extent, and bound together into unity by the nexus or content, it follows,

(1) That the concept being—the highest genus, since it is a maximum as to extent, and a minimum as to content—is capable of extensive distinctness, but incapable of comprehensive.

(2) That an individual concept, being a maximum as to content, but a minimum as to extent, is capable of comprehensive distinctness, but incapable of extensive.

(3) That a concept neither the highest genus nor individual, since it is not a minimum either as to content or extent, is capable both of comprehensive and extensive distinctness.

4th. *Rules for distinctness.* These are the following:

(1) To secure comprehensive distinctness, analyze the content of the concept, noting especially the positive, intrinsic, and essential elements, rather than the negative, extrinsic, and accidental.

(2) To secure extensive distinctness, divide the extent of the concept, according to the peculiar, positive characteristics of the parts.

5th. *Sources of indistinctness.* These are of two kinds:

(1) The nature of the concept itself, which is multiplicity, either as to content or extent, bound by a mental act, into unity.

(2) The dependence of the concept on language, as the condition of its continuance. The name becomes a symbol for the concept, and frequently the mind is content to employ the word without taking the trouble to call up the concept. This may be well when we are able to call up, at pleasure, the meaning of the word, in a clear and distinct concept, thus relieving the mind of an unnecessary burden. But when the mind employs a word without the ability to call up the corresponding concept, indistinctness and confusion of thought are sure to follow. Use no word whose meaning is not clear.

6th. *Illustrations of clearness and obscurity, distinctness and indistinctness.* Hamilton says: "The expressions, clearness and obscurity, distinctness and indistinctness, as applied to concepts, originally denoted certain modifications of vision; from vision, they were analogically extended to the other senses, to imagination, and finally to thought. It may, therefore, enable us the better to comprehend their secondary application to consider their primary.

"To Leibnitz we owe the precise distinction of concepts into clear and distinct, and from him I borrow the following illustration: In darkness — the complete obscurity of night — we see nothing — there is no perception, — no discrimination of objects. As the light dawns, the obscurity diminishes, the deep and uniform sensation of darkness is modified, — we are conscious of a change, — we see something, but are still unable to distinguish

its features,—we know not what it is. As the light increases, the outlines of wholes begin to appear, but still not with a distinctness sufficient to allow us to perceive them completely; but when this is rendered possible by the rising intensity of the light, we are then said to see clearly. We then recognize mountains, plains, houses, trees, animals, etc.; that is, we discriminate these objects as wholes, as unities, from one another. But their parts, —the manifold, of which these unities are the sum— their parts still lose themselves in one another; they are still but indistinctly visible.

"At length, when daylight has fully sprung, we are enabled likewise to discriminate their parts; we now see distinctly what lies around us. But still we see as yet only the wholes which lie proximately around us, and of these only the parts which possess a certain size. The more distant wholes, and the smaller parts of the nearer wholes, are still seen by us only in their conjoint result, only as they concur in making up that whole which is for us a visible minimum. Thus it is, that in the distant forest, or on the distant hill, we perceive a green surface; but we see not the several leaves, which in the one, nor the several blades of grass, which in the other, each contributes its effect to produce that amount of impression which our consciousness requires. Thus it is, that all which we do perceive is made up of parts which we do not perceive, and consciousness is itself a complement of impressions which lie beyond its apprehension.

"Clearness and distinctness are thus only relative. For, between the extreme of obscurity and the extreme of distinctness, there is in vision an infinity of intermediate degrees. Now, the same thing occurs in thought. For we may either be conscious only of the concept in general, or we may also be conscious of its various con-

stituent parts, or both the concept and its parts may be lost in themselves to consciousness, and only recognized to exist by effects which indirectly evidence their existence." *Logic*, page 112.

7th. *Other qualities of concepts.* These are as follows:

(1) *Valid concepts* are those which are known to correspond to their objects. Validity depends on evidence.

(2) *Invalid concepts* are those which are not known to correspond to their objects. Invalidity implies want of evidence.

(3) *True concepts* are those which correspond to their objects. True concepts may be valid or invalid according as there is a presence or absence of evidence. Valid concepts are always true, but true concepts are not always valid. It is possible to assume the truth without evidence. A concept is true or false, since it is an implicit judgment, which is true or false.

*False concepts* are those which do not correspond to their objects. False concepts are always invalid, but invalid concepts are not always false.

A concept, therefore, to be both true and valid *must* correspond to its object, and must be also known to correspond to its object. The correspondence must hold as far as the concept goes, though the concept may not do full justice to the object.

(5) *Congruent concepts* are those in which all the elements harmonize, that is, run together without conflict.

(6) *Incongruent concepts* are those which embrace conflictive elements—contrary or contradictory elements. Incongruity is a mark of invalidity, and indicates that some element has been assumed without warrant. Validity implies congruity; but congruity does not imply validity, since there may be absence of evidence.

(7) *Complete concepts* are those which involve *all the* common elements, and embrace all the divisions and sub-

divisions of the class down to the individuals. Completeness is, in general, an ideal perfection. Very few, if any, of our concepts are complete.

(8) *Incomplete concepts* are those which embrace only a part of the elements or objects of the class. Incompleteness characterizes most, if not all, of our concepts. Most objects have qualities which have escaped our observation; and most classes have individuals altogether unknown to us. Different persons may form different concepts of the same class, since one person may combine one set of attributes, and another person, another set. The same person may, at different times, form different concepts of the same class. The concept may change with advancing knowledge.

8th. *Symbolic and intuitive knowledge.* To illustrate this distinction, we quote from Leibnitz and from Taine.

(1) *Leibnitz* says, as quoted by Hamilton: "For the most part, however, especially in an analysis of any length, we do not view, at once, the whole characters or attributes of the thing, but in place of these we employ signs, the explication of which into what they signify, we are wont, at the moment of actual thought, for the sake of brevity, to omit, knowing or believing that we have this explication always in our power. Thus, when I think of a regular chiliagon, I do not always consider the various attributes of the sides, of their equality, and of the number, a thousand, but I use these words, whose meaning is obscurely and imperfectly presented to the mind, in lieu of notions which I have of them, because I remember that I possess the signification of these words, though their application and explication, I do not, at present, deem necessary. This kind of thinking, I am used to call *blind* or *symbolic*. We employ it not only in algebra and arithmetic, but in fact universally. And certainly, when the notion is very com-

plex, we can not think, at once, all the ingredient notions; but when this is possible — at least, inasmuch as it is possible — I call the cognition *intuitive*.

"Of the primary elements of our notions, there is given no other knowledge than the intuitive; as of our composite notions, there is, for the most part, possible only a symbolic. From these considerations, it is evident that of the things which we distinctly know, we are not conscious of the ideas, except so far as we employ an intuitive cognition. Indeed, it happens that we often falsely believe that we have in our minds the ideas of things, erroneously supposing that certain terms which we employ had been applied and explicated; and it is not true, at least it is ambiguously expressed, what some assert,—that we can not speak concerning any thing, understanding what we say, without having an idea of it actually present. For we frequently apply any kind of meaning to the several words, or we merely recollect that we have formerly understood them; but because we are content with this blind thinking, and do not follow out the resolution of the notions, it happens that contradictions are allowed to lie hid, which perchance the composite notion involves." *Logic*, page 128. Symbolic and intuitive knowledge thus clearly differ.

(2) *Taine* says: "My garden is surrounded by a hedge, and my fruit is stolen; I determine on enclosing it with a wall. I get what workmen I can in the village — four, for instance — and at the end of the day, I find they have built twelve meters of wall. This is not fast enough; I send to the next village for six other workmen, and ask myself how many meters a day will be added to the wall. To find out this, I no longer picture to myself workmen, with their blouses and trowels — the wall with its stones and mortar,— but replace my *first* workmen by the figure four, the first amount of work

by the figure twelve, the whole number of workmen by the figure ten, the amount of work they will do by the symbol $x$, and write down the following proportion,

$$4 : 12 : : 10 : x = \frac{12 \times 10}{4} = 30.$$

"Henceforth, barring accident or drunkenness, if the new men work like the old, and all continue to work together, as the first four began, my ten men will build thirty meters a day. Operations of this kind occur daily, and all practical calculations are made in this way.

"For the real objects first imagined, figures are substituted which replace them partially; they replace them in the only point of view in which we need consider them, that is, in point of number. This once effected, we forget the objects represented; they recede into the background; we only consider the figures; we assemble, compare, transpose, and manipulate them as more convenient equivalents; and the figure we finally arrive at, indicates the object or group of objects at which we wish to arrive.

"Substitution goes further than this, and figures substituted for things have in turn letters substituted for them. After several similar calculations, I observe that, in all such cases, the proportion is written in the same way — that the first figure always represents the first workmen; the second figure, their work; the third, the whole number of workmen; the fourth, the unknown work; and I thus pass from arithmetic to algebra. Henceforth, I replace the first figure by $A$, the second by $B$, the third by $C$, and write down as follows:

$$A : B : : C : x = \frac{B \times C}{A}.$$

"I see that, in every such case, if I want to know

the amount of work which will be done by all the workmen, it will be sufficient to multiply their number by that representing the work done by the first lot, and then to divide the product by the number of workmen first employed.

"Instead of this simple case, let us consider the labor of an analyist, who writes equations by the hour. He lays aside the figures, but indirectly he is working on them, just as an arithmetician lays aside the facts, but works indirectly on the facts. Each of them arranges and combines symbols, and these symbols are *substitutes*. The fact is, they are not like proper names, substituted for the whole of the object they represent, but merely for a portion or an aspect of such object. The letter used in Algebra does not fully replace the arithmetical figure with its precise quantity, but only as regards its function and place in the equation it enters *into*. The arithmetical figure does not fully replace the thing it stands for, with all its qualities and characters, *but* only as regards quantity and number. Each replaces a part only of the imagined object; that is to say, a *fragment* —an extract; the figure, a more complex extract; the letter, a less complex one; that is to say, an extract *from* the first extract. But the substitution, though partial, is none the less actual. Two complete and infinitely fertile sciences depend on it, and derive their efficiency from it." *Taine on Intelligence*, page 4.

## CHAPTER VIII.

### RELATION OF CONCEPTS.

**The reciprocal relation** of concepts may be considered with respect to their comprehension and to their extension, thus giving two independent classifications.

**1. As to comprehension**, we may consider identity and diversity, congruity and incongruity, the intrinsic and the extrinsic, subordination and co-ordination.

1st. *Identity and diversity.* Two concepts, when compared, are found to comprise either the same elements or different elements, giving rise to the distinctions of identical concepts and different concepts, or, in general, of identity and diversity.

(1) *Identity.* Identical concepts are either absolutely identical or relatively identical.

*a. Absolute identity.* No two concepts are *absolutely identical;* for, if so, they could not be distinguished as two, since they would have no difference by which they could be discriminated. This class of concepts, therefore, has not a *real*, but only an *ideal* existence, and constitutes an imaginary member in the division of identical concepts. Even the concepts relating to the same class, formed by different minds, or by the same mind at different times, which make the nearest approach to absolute identity, are distinguishable; for, we can say, that the one was formed by this mind, and the other by that, or that one was formed by a mind at one time, and the other by the same mind at another time. These concepts, if otherwise identical, are *numerically* differ-

ent—one can be distinguished as the first, and the other as the second. The difference is not intrinsic, but extrinsic; not essential, but accidental.

*b. Relative identity.* Concepts relatively identical are of two kinds—reciprocating, or convertible, and similar, or cognate.

*a.* Concepts relatively identical are *reciprocating*, or *convertible*, when they relate to the same class, but designate it, in the one case, by one set of attributes, and, in the other case, by another set. Thus, the concept of the class denominated equilateral triangles, designates the class by the equality of the sides, while the concept of the class denominated equiangular triangles, designates the class by the equality of the angles. But since, in the case of triangles, the equality of the sides involves the equality of the angles, and conversely, the class of triangles denominated equilateral is identical with the class denominated equiangular; hence, the concepts of this class corresponding to the expressions, equilateral triangles and equiangular triangles, though not absolutely identical, since in the one case, the equality of the sides is made prominent, and, in the other, the equality of the angles, yet are relatively identical, or more specifically, reciprocating, or convertible, since one involves the other.

*β.* Concepts relatively identical are *similar*, or *cognate*, when they belong to the same family, and having the same origin are thus kindred. Certain languages are said to be cognate, and the same may be said of certain virtues or vices.

(2) *Diversity.* Different concepts are either absolutely different or relatively different.

*a. Absolute difference.* No two concepts are *absolutely* different; for, if not subordinate to any lower genus, they are, at least, subordinate to *being*, the highest

genus, and hence agree in possessing *existence*, the attribute of this genus, though they differ in other respects. Absolutely different concepts, therefore, constitute an ideal or imaginary member of the class different concepts, and merely give symmetry to the classification.

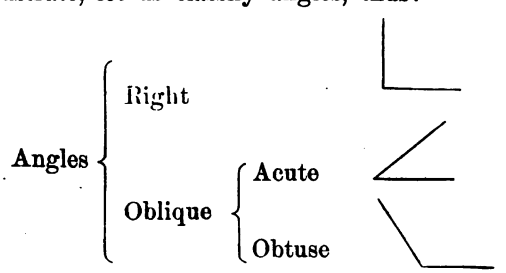
*b. Relative difference.* Concepts relatively different are distinguished by the fact that they possess diverse attributes, though they have other attributes in common.

The *laws* of resemblance and difference are as follows:

(1) *The law of homogeneity.* However different two concepts, they must, in some respect, at least in that of existence, be alike; for, every other concept is subordinate to that of being. Hence, things most dissimilar must, in one respect at least, be similar.

(2) *The law of heterogeneity.* Every concept contains other concepts under it. In thought, therefore, the division of concepts gives concepts, not individuals. Hence, things most similar, must, in certain respects, be dissimilar. Thus, take any two concepts with a small difference. Now, this difference can be divided, thus giving new concepts distinguished by this partial difference, and so on, *ad infinitum*. But the infinite divisibility of concepts, like the infinite divisibility of space, time, or matter, exists only in speculations.

To illustrate, let us classify angles, thus:




Here we pause, not because it is impossible to pursue

the divisions further, but because it is not called for. But we can conceive these angles to be situated in a horizontal, a vertical, or an oblique plane, giving horizontal, vertical, or oblique angles. These angles may have any position in these planes, and the sides may take an infinite number of directions for each position of the vertex. The acute angle may vary through an infinite number of values, between the limits 0° and 90°, and the obtuse angle may vary, in like manner, between the limits 90° and 180°.

2d. *Congruity and incongruity.* Again, as to comprehension, two concepts are either congruent or conflictive.

(1) *Congruity.* Two concepts are congruent, if they can be united in thought, so that one can be affirmed of the other, or both can be affirmed of the same object. Thus, triangles are polygons. A single concept is congruous if all its elements harmonize, as a square field.

(2) *Incongruity.* Incongruous concepts are conflictive, since they involve inconsistent attributes. They are of two kinds — contraries and contradictories.

*a. Contrary* concepts are mutually repugnant, though not universally inclusive of their genus. Thus, the concepts of the classes triangles and quadrilaterals are contrary, since they do not include all the divisions of the genus polygon.

*b. Contradictory* concepts are mutually repugnant and universally inclusive of the genus of which they are species. Thus, right triangles and oblique triangles are contradictories within the sphere of the genus triangle. Any triangle is either right or oblique; if it is one, it is not the other; and if it is not one, it is the other. But within the sphere of another genus, as polygon, right triangles and oblique triangles are not contradictories. Hence, contradictories in a restricted sphere are not necessarily contradictories when the sphere is enlarged.

Thus, honest and dishonest are contradictories within the sphere of moral beings, but not within the sphere of beings. Thus, vertebrate and invertebrate are contradictories within the sphere of animals; organic and inorganic, within the sphere of beings; the ego and the non-ego, *A* and not-*A*, being and non-being, are universally contradictories, since their sphere is absolutely unlimited, the two members together comprehending every thing, existent and non-existent.

A single concept is incongruous, when it involves conflictive elements, as a round square.

Identity is to be distinguished from congruity, and diversity from confliction. All identical concepts are congruent, but all congruent concepts are not identical. Thus, the concepts of the classes, equilateral triangles and equiangular triangles are relatively identical and congruent; learning and virtue are congruent, but not identical. All conflictive concepts are diverse, but all diverse concepts are not conflictive. Thus, virtue and vice, beauty and ugliness, are conflictive and diverse; but virtue and beauty are diverse but not conflictive.

3d. *The intrinsic and extrinsic.* As to comprehension, we may also regard concepts as intrinsic or extrinsic.

(1) *Intrinsic* concepts are those which involve the qualities necessary to the existence of the class—they contain essential elements. Thus, the concept of a triangle involving three sides and three angles, is intrinsic.

(2) *Extrinsic* concepts are those which consist of accidental qualities—those not essential to the existence of the class. Thus, the concept of a triangle involving the equality of its sides, is extrinsic.

4th. *Subordination and co-ordination.* As to comprehension, we may regard concepts in the relation of subordination or co-ordination.

(1) One concept is *subordinate* to another, as to com-

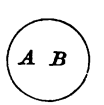
prehension, when the first forms a part of the sum total of the elements which together constitute the comprehension of the second. The concepts of sides, angles, and area of a triangle are involved in the concept of the class triangle.

(2) Two or more concepts are *co-ordinate*, as to comprehension, when they are exclusive and both are immediately comprehended as elements of the same concept. Thus, the concepts of the sides, angles, and area of a triangle, are co-ordinate with one another, though alike subordinate to the concept triangle.

**2. As to extension**, we may consider co-extension, subordination, exclusion, and intersection.

1st. *Co-extension.* One concept is *co-extensive* with another, when they relate to the same class, and thus have the same sphere. Thus, equilateral triangles and equiangular triangles are co-extensive. In comprehension, these concepts are called reciprocating or convertible. Of the two elements, the equality of the sides, and the equality of the angles, that which is explicitly enounced in the one is implicitly involved in the other, and conversely. The subject and predicate of a definition are co-extensive. Thus, in the definition, a triangle is a polygon of three side, the concepts, triangle, and a polygon of three sides, are co extensive.

Co-extension may be symbolized by two equal co-incident circles, which appear as one, though indicated as two by two letters placed within, thus:




2d. *Subordination.* One concept is subordinate to another, when, as to extension, the former is contained under the latter, as an individual under a species, or a species under a genus. If one concept is subordinate to another, it is subordinate to any higher concept embracing the other. Thus, since horse is subordinate to

the genus *equus*, it is subordinate to quadruped, vertebrate, animal, organized being, being.

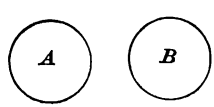
Subordination may be symbolized by one circle within another, the inner circle denoting the subordinate concept. Thus, *A* is subordinate to *B*.


3d. *Exclusion.* One concept is excluded from another, when they have nothing in common as to extension. Thus, the concepts of the classes *horse* and *dog*, afford an example of exclusion, as to extension, since they have neither species nor individuals in common.

Exclusive concepts may be either co-ordinate or non-co-ordinate,—*co-ordinate*, when each is subordinate to the same concept, as acute angles and obtuse angles, which are immediately subordinate to oblique angles,—*non-co-ordinate*, when one, but not the other is immediately subordinate to a third concept, as right angles and acute angles, right angles being immediately subordinate to angles, and acute angles to obliqe angles.

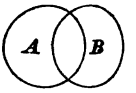
Exclusive concepts are *conflictive*, as to comprehension, and are either contrary or contradictory,—*contrary*, when they are not universally inclusive of their genus, —*contradictory*, when they are universally inclusive of their genus. Thus right angles and acute angles are contraries, while right angles and oblique angles are contradictories.

The exclusion of contraries may be symbolized by two exclusive circles. Thus, the circles *A* and *B*.




The exclusion of contradictories may be symbolized by one circle and the indefinite surrounding space in the plane of the circle —the circle denoting one of the contradictories, and the indefinite space the other, as *A* and *B* in the annexed figure.

4th. *Intersection.* Two concepts *intersect*, when their extensions have a common part, and the extension of each a part not common with the other. Thus, the concepts men and liars intersect. For, some men are liars; some liars are men; some men are not liars; and some liars are not men.




Intersection may be symbolized by two intersecting circles. The concepts symbolized by *A* and *B*, intersect.

This method of representing the relation of the concepts of classes, as to extension, is due to *Euler*. The circles do not, of course, *resemble* the concepts, but the *relation* of the circles does correctly represent the relation of the extension of the concepts.

## CHAPTER IX.

### JUDGMENT.

**1. A judgment** is the decision that a certain relation exists between two objects of thought.

It has already been seen that every act of cognition involves a judgment. A concept itself is an implicit or undeveloped judgment. This is evident from an analysis of the act of conception, for, in conception certain attributes are regarded as belonging to all the objects of a class, thus involving the judgment that each object of the class has these attributes.

The judgments involved in a concept are called primary or psychological. They have individual objects for their subjects, and attributes or concepts for their predicates. Judgments in which concepts are predicated of concepts are called secondary or logical.

**2. A proposition** is the expression of a judgment. For the purposes of logic, a proposition is considered as consisting of three parts—a subject, always a substantive or a substitute for a substantive, that of which something is affirmed or denied, a predicate, also a substantive or its substitute, that which is affirmed or denied of the subject; and the copula, *is* or *is not*, or in the plural, *are* or *are not*, which affirms or denies the predicate of the subject. Thus, horses are animals, lying is not a virtue.

Such propositions as, trees grow; birds are beautiful, are put into the requisite form by saying, Trees are things which grow. Birds are beautiful animals.

A proposition does not necessarily imply the real existence of the object denoted by the subject; for this object may be imaginary, as in the proposition, A centaur is half horse and half man. Whether the subject denotes a real or an imaginary object is to be determined by considerations independent of the proposition.

3. The terms of a proposition, from *termini*, limits or boundaries, are the subject and predicate, which limit or mark the extremes of a proposition. A term expresses an individual or a group of individuals, an attribute or a group of attributes.

1st. A *singular term* is expressive of an individual. Thus, Plato, George Washington, this boy, etc., are singular terms.

2d. A *common term* is expressive of each individual of a class, as well as the class itself. Thus, man, horse, tree, etc., are common terms.

3d. A *collective term* is expressive of a group, but not of each individual of the group. Thus, the senate, the convention, the army, etc., are collective terms, since we can say this body of men is the senate, but not that Sherman is the senate, etc.

4th. An *attributive term* is an adjective or a participle expressing an attribute or a group of attributes. Thus, white, human, etc. For logical purposes, a noun is understood when an attributive is the predicate. Thus, Plato is human, is logically equivalent to, Plato is a human being. An attributive can not by itself be used as the subject, but only in connection with a noun, as this human being is Plato.

5th. An *abstract term* is a noun expressive of an attribute or a group of attributes considered apart from the object to which it belongs. Thus, humanity, virtue, form, color, etc. An abstract term may, by itself, be either the subject or the predicate of a proposition.

**4. The modality** of a proposition is the view of it taken by the mind as influenced by the degree of evidence. It is expressed by an adverb in connection with the copula. Thus, This is certainly the boy who stole the fruit; this is probably the boy who stole the fruit, etc. These propositions may be expressed in the usual logical form, thus, That this is the boy who stole the fruit is a certainty, etc.

**5. The classification** of judgments may be with reference to logical quantity, origin, validity, truth, or form.

1st. As to *logical quantity*, judgments are comprehensive or extensive, according as the quantity of the predicate is comprehensive or extensive.

(1) A *comprehensive* judgment is one in which the predicate is considered in reference to its content. Thus, these houses are white.

(2) An *extensive* judgment is one in which the predicate is considered in reference to its extent. Thus, a horse is an animal.

A comprehensive judgment may be turned into an extensive judgment. Thus, these houses are white, is equivalent to these houses are white objects.

In a comprehensive judgment, the subject is the whole of comprehension of which the predicate is affirmed or denied to be a part. The copula *is* or *is not*, signifies *comprehends* or *does not comprehend.*

In an extensive judgment, the predicate is the whole of extension of which the subject is affirmed or denied to be a part. The copula, *is* or *is not*, signifies *is contained under* or *is not contained under.*

A *definition* is both an extensive and a comprehensive judgment; for the predicate as the genus of the subject is extensive, while the differential quality is comprehensive, and thus limits the extent of the subject to that part of the predicate characterized by this quality.

2d. As to *origin*, judgments are primitive or derivative, according as they are original or derived.

(1) A *primitive* judgment is assumptive or intuitive, according as the relation of the subject and predicate is an assumption or an intuition. Thus, Mars is inhabited, is a primitive judgment, since it is not derived from other judgments; and is assumptive, since it is not known to be true. Either of two equal quantities is a substitute for the other, is both a primitive and an intuitive judgment.

(2) A *derivative* judgment is demonstrative or problematical, according as it is capable or incapable of proof. A judgment which is strictly demonstrative may be regarded as problematical till it is proved true.

3d. As to *validity*, judgments are valid or invalid.

(1) A judgment is *valid*, when the concepts are valid, and the relation is intuitive or demonstrative. It is valid, if its truth is known. A valid judgment is true.

(2) A judgment is *invalid*, when the law of validity is not complied with. It is invalid, if its truth is not known. An invalid judgment is true or false.

4th. As to *truth*, judgments are true or false.

(1) A judgment is *true*, when the relation expressed corresponds to the reality. A true judgment is valid or invalid according to evidence.

(2) A judgment is *false*, when the relation expressed does not correspond to the reality. A false judgment is invalid.

Validity depends on evidence, and implies truth, but truth on correspondence, with or without evidence.

5th. As to *form*, judgments are either categorical or conditional.

(1) A *categorical* judgment is one in which the relation expressed is not qualified by a condition. Thus, horses are animals; some men are liars; *S* is *P*.

(2) A *conditional* judgment is one in which the relation expressed is qualified by a condition.

There are three varieties of conditional judgments—hypothetical, disjunctive, and dilemmatic.

*a.* A ***hypothetical*** judgment is a conditional judgment in which the qualifying condition is an hypothesis. Thus, if *A* is *B*, *C* is *D*.

*b.* A *disjunctive* judgment is a conditional judgment in which the qualifying condition is an alternative. Thus, *A* is *B* or *C*, which is equivalent to, if *A* is not *C*, *A* is *B*, or if *A* is not *B*, *A* is *C*.

*c.* A *dilemmatic* judgment is a conditional judgment in which there are two qualifying conditions—an hypothesis and an alternative. Thus, if *A* is *B*, *C* is D or E.

**6. The principles of expression** are those warranting affirmation, negation, hypothecation, or disjunction.

1st. *Affirmation* is either immediate or mediate.

(1) *Immediate* affirmation is warranted by knowledge gained by empirical intuition, as in consciousness, or by rational intuition, as the fundamental axioms of thought or the special axioms of the various sciences.

(2) *Mediate* affirmation is warranted in several ways:

*a.* By the law of contradictories. Thus, we can affirm either of two contradictories, if we know the other is false.

*b.* By valid inference from a single proposition. Thus. if I know that all *S* is *P*, I can affirm that some *S* is *P*, or that some *P* is *S*.

*c.* By logical deduction from valid premises. Thus, if I know that all *M* is *P*, and that all *S* is *M*, I am warranted in affirming that all *S* is *P*.

2d. *Negation* is either immediate or mediate.

(1) *Immediate* negation is warranted by the principle of identity—a thing is not any thing other than itself.

(2) *Mediate* negation is warranted in several ways:

*a.* By the law of conflictives. Thus, knowing the truth of either of two conflictives, we are warranted in denying the other.

*b.* By a valid inference from a single proposition. Thus, knowing that no $S$ is $P$, we can affirm that some $S$ is not $P$, or that no $P$ is $S$.

*c.* By logical deduction from valid premises. Thus, knowing that no $M$ is $P$, and that all $S$ is $M$, we are warranted in affirming that no $S$ is $P$.

3d. *Hypothecation* is warranted, if the condition is a valid reason for the consequent, thus, if $A$ has the fever, he is sick.

4th. *Disjunction* is warranted by two reasons:

(1) When the parts of the predicate are contradictories. Thus, a triangle is right or oblique.

(2) When the parts of the predicate are all of the contraries. Thus, an angle is right, acute, or obtuse.

## CHAPTER X.

### CATEGORICAL JUDGMENTS.

1. **Categorical judgments** are classified as to quantity and as to quality.

1st. As to *quantity*, categorical judgments are universal or particular—*universal*, when the predication, that is, the affirmation or denial, is made of all the subject, as all $S$ is $P$, no $S$ is $P$; *particular*, when the predication is made of only a part of the subject, as some $S$ is $P$, some $S$ is not $P$.

2d. As to *quality*, categorical judgments are affirmative or negative—*affirmative*, when the predicate is affirmed of the subject, as all $S$ is $P$, some $S$ is $P$; *negative*, when the predicate is denied of the subject, as no $S$ is $P$, some $S$ is not $P$.

An *individual proposition*, as John is a man, is to be regarded as a universal.

An *indefinite proposition*, one devoid of any mark of quantity, is to be interpreted, either as a universal or as a particular, according to the matter, but this interpretation is extra-logical, since logic deals with the form of thought and not with the matter. Thus, *planets are subject to the law of gravitation*, is interpreted as a universal—all planets are subject to the law of gravitation. *Metals are useful* is interpreted as a particular—some metals are useful.

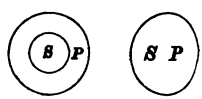
Dividing with respect to quantity, and subdividing with respect to quality, denoting the universal affirmative by ($A$), the universal negative by ($E$), the particu-

lar affirmative by (*I*), and the particular negative by (*O*), we have the following summary classification of categorical judgments:

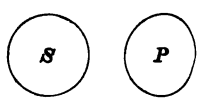
| | | |
|---|---|---|
| Universal | Affirmative (*A*) | All *S* is *P*. |
| | Negative (*E*) | No *S* is *P*. |
| Particular | Affirmative (*I*) | Some *S* is *P*. |
| | Negative (*O*) | Some *S* is not *P*. |

**2. The laws of truth** are the following:

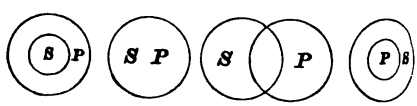
1st. (*A*), All *S* is *P*, is true, if *S* is subordinate to *P*, or if *S* is co-extensive with *P*



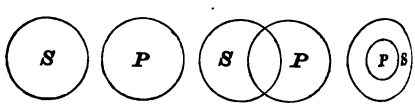

2d. (*E*), No *S* is P, is true, if *S* is excluded from *P*.



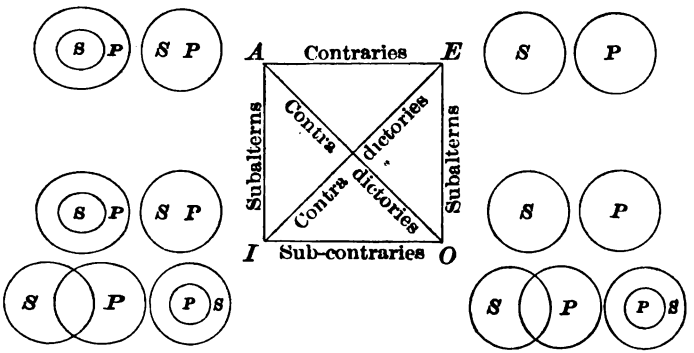

3d. (*I*), Some *S* is *P*, is true, if (*A*) is true, as above, also if *S* intersects *P*, or if *P* is subordinate to *S*.




4th. (*O*), Some *S* is not *P*, is true, if (*E*) is true, as above, also if *S* intersects *P*, or if *P* is subordinate to *S*.




**3. The relation** of the propositions, (*A*), (*E*), (*I*), (*O*), or as it is commonly called, their *opposition*, is thus shown:




1st. *In relation to agreement or disagreement in quantity or quality.*

(1) (*A*) and (*E*) agree in quantity, both being universal; they disagree in quality, (*A*) being affirmative, and (*E*) negative.

(2) (*I*) and (*O*) agree in quantity, both being particular; they disagree in quality, (*I*) being affirmive, and (*O*) negative.

(3) (*A*) and (*I*) agree in quality, both being affirmative; they disagree in quantity, (*A*) being universal, and (*I*) particular.

(4) (*E*) and (*O*) agree in quality, both being negative; they disagree in quantity, (*E*) being universal, and (*O*) particular.

(5) (*A*) and (*O*) disagree both in quantity and in quality, (*A*) being universal and affirmative, and (*O*) particular and negative.

(6) (*E*) and (*I*) disagree both in quantity and in quality, (*E*) being universal and negative, and (*I*) particular and affirmative.

2d. *As to agreement or disagreement in truth or falsity.*

Let it be observed that there are five different relations possible between *S* and *P*,— *S* is subordinate to *P*,

*S* is co-extensive with *P*, *S* is excluded from *P*, *S* intersects *P*, and *P* is subordinate to *S*.

(1) (*A*) and (*E*) are mutually repugnant, since neither relation, *S* is subordinate to *P*, or *S* is co-extensive with *P*, included in (*A*), is found in (*E*), nor is the relation, *S* is excluded from *P*, which is expressed by (*E*), found in (*A*); hence, having no relation common, they can not both be true, and therefore the truth of either implies the falsity of the other. If it is true that all *S* is *P*, it is false that no *S* is *P*, and if it is true that no *S* is *P*, it is false that all *S* is *P*.

(2) (*A*) and (*E*) are not universally inclusive of all possible relations of *S* and *P*, since there are other relations, as *S* intersects *P*, *P* is subordinate to *S*, not found in either; hence, not including all possible relations, they may both be false, and therefore the falsity of either does not imply the truth of the other.

(3) Hence, (*A*) and (*E*) are called *contraries*, since they are mutually repugnant, but not universally inclusive. Other relations are possible.

(4) Since the relations in (*A*) are found in (*I*), the truth of (*A*) involves the truth of (*I*). For this reason, (*A*) and (*I*) are called *subalterns*, though, strictly, (*I*) is the subaltern of (*A*).

(5) Since (*I*) contains relations not found in (*A*), as well as those in (*A*), the falsity of (*A*) does not imply the falsity of (*I*), nor does the truth of (*I*) imply the truth of (*A*), but the falsity of (*I*) implies the falsity of (*A*), since the relations in (*A*) are in (*I*).

(6) For like reasons, (*O*) is the subaltern of (*E*), the truth of (*E*) implies the truth of (*O*), the falsity of (*E*) does not imply the falsity of (*O*), nor does the truth of (*O*) imply the truth of (*E*), but the falsity of (*O*) implies the falsity of (*E*).

(7) Since (*I*) and (*O*) contain the common relations,

*S* intersects *P*, and *P* is subordinate to *S*, both may be true; hence, the truth of either does not imply the falsity of the other.

(8) Since (*I*) and (*O*) are universally inclusive of all possible relations of *S* and *P*, both can not be false; hence, the falsity of either implies the truth of the other.

(9) Since (*I*) contains relations not found in (*O*), and (*O*) a relation not found in (*I*), either may be true and the other false; hence, the truth of either does not imply the truth of the other.

(10) (*I*) and (*O*) are subordinate to (*A*) and (*E*), respectively, and hence are called *sub-contraries.*

(11) (*A*) and (*O*) are mutually repugnant, since they contain no common relation; hence, they can not both be true, and therefore the truth of either implies the falsity of the other; and since they are universally inclusive of all possible relations of *S* and *P*, both can not be false, and therefore the falsity of either implies the truth of the other. Hence, (*A*) and (*O*) are called contradictories, since they are mutually repugnant and universally inclusive.

(12) For like reasons, (*E*) and (*I*) are contradictories; hence, the truth of either implies the falsity of the other, and the falsity of either, the truth of the other.

3d. These relations may likewise be thus expressed:

(1) The truth of (*A*) implies the truth of (*I*) and the falsity of (*E*) and (*O*); but the falsity of (*A*) implies the truth of (*O*).

(2) The truth of (*E*) implies the truth of (*O*) and the falsity of (*A*) and (*I*); but the falsity of (*E*) implies the truth of (*I*).

(3) The truth of (*I*) implies the falsity of (*E*); but the falsity of (*I*) implies the truth of (*E*) and (*O*) and the falsity of (*A*).

(4) The truth of (*O*) implies the falsity of (*A*); but

the falsity of (*O*) implies the truth of (*A*) and (*I*) and the falsity of (*E*).

Let the student answer the following questions:

(1) What does the truth of (*A*) imply? What the falsity of (*A*) imply?

(2) What does the truth of (*E*) imply? What does the falsity of (*E*) imply?

(3) What does the truth of (*I*) imply? What does the falsity of (*I*) imply?

(4) What does the truth of (*O*) imply? What does the falsity of (*O*) imply?

(5) What implies the truth of (*A*)? the falsity of (*A*)?

(6) What implies the truth of (*E*)? the falsity of (*E*)?

(7) What implies the truth of (*I*)? the falsity of (*I*)?

(8) What implies the truth of (*O*)? the falsity of (*O*)?

(9) Show in three ways that the falsity of (*I*) implies the truth of (*O*).

(10) Show in three ways that the falsity of (*O*) implies the truth of (*I*).

4th. These relations may receive a more general expression:

(1) The truth of a universal implies the truth of its particular; but the falsity of a universal does not imply the falsity of its particular.

(2) The falsity of a particular implies the falsity of its universal; but the truth of a particular does not imply the truth of its universal.

(3) The contraries can not both be true, but may both be false; hence, the truth of either implies the falsity of the other; but the falsity of either does not imply the truth of the other.

(4) The sub-contraries can not both be false, but may both be true; hence, the falsity of either implies the truth of the other; but the truth of either does not imply the falsity of the other.

(5) Two contradictories can not both be true nor both false; hence, the truth of either implies the falsity of the other, and the falsity of either the truth of the other.

In the above discussion, we have considered the *form* of the proposition but not the *matter*.

5th. The following statements, though extra-logical, may be found to be useful.

(1) In *necessary* matter, the affirmatives, (*A*) and (*I*), are both true, and the negatives, (*E*) and (*O*), are both false. Thus, all triangles have three sides, and some triangles have three sides, are both true; but no triangles have three sides, and some triangles have not three sides are both false.

(2) In *contingent* matter, the particulars, (*I*) and (*O*), are both true, and the universals, (*A*) and (*E*), both false. Thus, some triangles are right, and some triangles are not right, are both true; but all triangles are right, and no triangles are right, are both false.

(3) In *impossible* matter, the negatives, (*E*) and (*O*), are both true, and the affirmatives, (*A*) and (*I*), both false. Thus, no triangles have four sides, and some triangles have not four sides, are both true; but all triangles have four sides, and some triangles have four sides, are both false.

## CHAPTER XI.

### CATEGORICAL JUDGMENTS.

**1. Distribution of terms.** — 1st. *Definition and remarks.* A term is *distributed* when it is applied to all the individuals denoted by the name. Thus, in the expressions, *all men*, *no men*, the term *men* is distributed.

A term is *undistributed* when it is applied only to some of the individuals denoted by the name. Thus, *men* is undistributed in the expression *some men*.

It would seem that distribution is applicable only to common terms; but as *singular*, *collective*, and *abstract* terms are, as we have seen, regarded as universal, they are regarded as distributed.

When an attribute is used as a predicate, the noun understood is to be supplied before the rule for distribution is to be applied. Thus, the proposition, the bird is beautiful, is changed to, the bird is a beautiful animal.

When an abstract term or an attributive has come to be regarded as a common noun, as *virtue*, *color*, *figure*, the *good*, etc., its distribution or non-distribution is regulated by the rules for common terms.

2d. *Rules for the distribution and non-distribution of the terms of a proposition.*

(1) *The subject of every universal proposition is distributed.* Thus, the subject is distributed in the following propositions: Every man is liable to accident; All $S$ is $P$; No selfish action is praiseworthy; No $S$ is $P$; Any coward is contemptible. The distribution of the subject is shown by one of the words, *every*, *all*, *no*, *any*.

(2) *The subject of every particular proposition is undistributed.* Thus, the subject is undistributed in the following propositions: Some men are liars; Some $S$ is $P$; Some men are not liars; Some $S$ is not $P$. The non-distribution of the subject is indicated by the word *some.*

It will be observed that the distribution or non-distribution of the subject depends upon the *quantity* of the proposition — the subject is distributed in universals, and undistributed in particulars.

(3) *The predicate of every negative proposition is distributed.* Thus, the predicate is distributed in the following propositions: No horse is a ruminant; Some apples are not red; No $S$ is $P$; Some $S$ is not $P$; for every individual of the class *ruminants* is excluded from the class *horse;* every red object, from the class *some apples;* and every $P$, from $S$.

(4) *The predicate of an affirmative is undistributed, unless the subject is co-extensive with the predicate, or the predicate is subordinate to the subject.* Thus, the predicate is undistributed in the propositions, All horses are animals; Some Americans are poets; All $S$ is $P$; Some $S$ is $P$; for all animals are not horses; all poets are not Americans; nor is it certain that all $P$ is $S$.

It will be observed that the distribution or non-distribution of the predicate depends on the *quality* of the proposition — the predicate is distributed in negatives, and is, in general, undistributed in affirmatives.

It may, indeed, be true, in fact, that the predicate of an affirmative is distributed, as in case of co-extension in ($A$) or ($I$), or when, in ($I$), $P$ is subordinate to $S$; but this is extra-logical, since it is not indicated by the *form*, with which alone logic has to deal. It is important, however, to note that co-extension is found in case of definitions, equations, identical propositions, and when $S$ and $P$ designate, by different properties, the same

class. Thus, A decagon is a polygon of ten sides; $A = B$; $A$ is $A$; All equilateral triangles are equiangular. $P$ is subordinate to $S$ in $(I)$, when $S$ is the genus of which $P$ is a species, as some animals are horses.

Hence, the rules for distribution may be thus stated:

(1) *All universals distribute their subject.*

(2) *All negatives distribute their predicate.*

(3) *No particular distributes its subject.*

(4) *An affirmative does not, in general, distribute its predicate.*

**2. Conversion of propositions—definitions, rule, classification.**—The *conversion* of a proposition is the transposition of its terms, or the interchange of the places of the subject and predicate. Thus, the conversion of the proposition, $S$ is $P$, gives the proposition, $P$ is $S$.

The *convertend*, or *exposita*, is the original poposition to be converted.

The *converse* is the proposition obtained by conversion.

The *general rule* to be observed in conversion is the following: *A term must not be distributed in the converse which is not distributed in the convertend.*

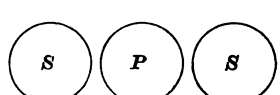
Conversion is *divided* into *immediate* and *mediate*, and each of these into *simple* and *by limitation*, or *per accidens*, as it is also called.

Conversion is *immediate* when the convertend is converted, without preliminary change of form; that is, the original proposition is itself converted.

1st. Immediate conversion is *simple*, when the converse has the same quantity and quality as the convertend, and is denoted by the same vowel.

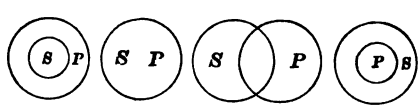
(1) $(E)$ *always admits of immediate simple conversion.*

$(E)$ No $S$ is $P$.
$\therefore$ $(E)$ No $P$ is $S$.



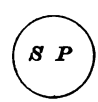
(2) (*I*) *always admits of immediate simple conversion.*

(*I*) Some *S* is *P*.
∴ (*I*) Some *P* is *S*.



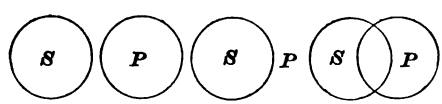

(3) (*A*) *admits of immediate simple conversion in case S and P are co-extensive, as in definitions, etc., but not in general.*

(*A*) All *S* is *P*.
∴ (*A*) All *P* is *S*.




(4) (*O*) *admits of immediate simple converse in case of exclusion or intersection, but not in general.*

(*O*) Some *S* is not *P*.
∴ (*O*) Some *P* is not *S*.



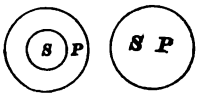

It thus appears that (*E*) and (*I*) universally admit of immediate simple conversion; and (*A*) and (*O*) in special cases—(*A*) in case of co-extension, and (*O*) in case of exclusion or intersection. To convert (*A*) by immediate simple conversion, in case *S* is subordinate to *P*, is to distribute *P* in the converse when it is not distributed in the convertend, and thus to violate the general rule, that a term is not to be distributed in the converse which is not distributed in the convertend. In like manner, to convert (*O*) by immediate simple conversion, in case *P* is subordinate to *S*, is to distribute *S* in the converse, when it is not distributed in the convertend, and thus to violate the *rule*.

2d. Immediate conversion is *by limitation*, when the

quantity is reduced, the convertend being *universal*, and the converse *particular*.

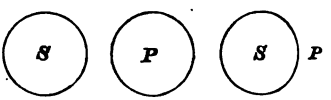
(1) (*A*) *always admits of immediate conversion by limitation.*

(*A*) All *S* is *P*.
∴ (*I*) Some *P* is *S*.




(2) (*E*) *always admits of immediate conversion by limitation.*

(*E*) No *S* is *P*.
∴ (*O*) Some *P* is not *S*.



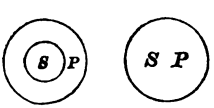

(*I*) *and* (*O*) *having already reduced quantity, can not be converted by limitation.*

Conversion is *mediate* when the convertend is converted through a preliminary change of form; that is, the original proposition itself is not converted, but is changed to another which is converted. Mediate conversion, when applied to (*A*), or (*E*) is called conversion by *contraposition*, and when applied to (*O*), conversion by *negation*.

3d. Mediate conversion is *simple* when the converse has the same quantity and quality as the proposition into which the original is changed, and hence is denoted by the same vowel.

(1) (*A*) *can always be changed to* (*E*) *which may be converted simply.*

(*A*) All *S* is *P*.
=(*E*) No *S* is *non-P*.
∴ (*E*) No *non-P* is *S*.

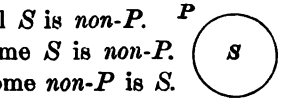



(2) (*E*), *in case S and P are contradictories, can be*

*changed into co-extensive* (*A*) or (*I*) *either of which may be converted simply.*

(*E*) No *S* is *P* = { (*A*) All *S* is *non-P.* / (*I*) Some *S* is *non-P.*

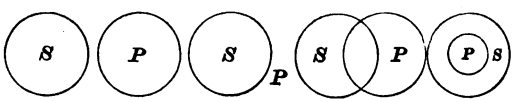
∴ (*A*) All *non-P* is *S.* (*I*) Some *non-P* is *S.*




(3) (*I*) *does not admit of mediate simple conversion.*

(4) (*O*) *can always be changed to* (*I*), *which may be converted simply.*

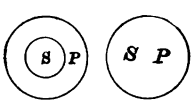
(*O*) Some *S* is not *P.*
= (*I*) Some *S* is *non-P.*
∴ (*I*) Some *non-P* is *S.*




Mediate conversion is by *limitation*, when the quantity is reduced, the original proposition and the proposition into which the original is changed, being *universal*, and the converse *particular.*

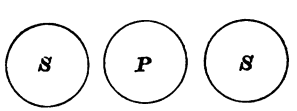
(1) (*A*) *can always be changed to* (*E*), *which may be converted by limitation.*

(*A*) All *S* is *P.*
= (*E*) No *S* is *non-P.*
∴ (*O*) Some *non-P* is not *S.*




(2) (*E*) *can always be changed into* (*A*), *which may be converted by limitation.*

(*E*) No *S* is *P.*
= (*A*) All *S* is *non-P.*
∴ (*I*) Some *non-P* is *S.*




(3) (*I*) *and* (*O*), *being particular, that is, already in reduced quantity, can not be converted by limitation.*

## CHAPTER XII.

### CONDITIONAL JUDGMENTS.

**Conditional Judgments** are, as we have seen, of three kinds—hypothetical, disjunctive, and dilemmatic.

**1. Hypothetical judgments** may be divided into five groups, each containing four forms. Let the laws of truth of each be exhibited by Euler's notation of circles, thus:

If *A* is *B*, *A* is *C*.
True, if *B* is *C*.


1st. *The subject of the condition is the subject of the consequent.*

(1) If *A* is *B*, *A* is *C*. True, if *B* is *C*.

(2) If *A* is *B*, *A* is not *C*. True, if *B* is not *C*.

(3) If *A* is not *B*, *A* is *C*. True, if *B* and *C* are contradictories.

(4) If *A* is not *B*, *A* is not *C*. True, if *C* is *B*.

2d. *The subject of the condition is the predicate of the consequent.*

(1) If *A* is *B*, *C* is *A*. True, if *C* is *B*, and *A* is coextensive with *B*.

(2) If *A* is *B*, *C* is not *A*. True, if *C* is not *B*.

(3) If *A* is not *B*, *C* is *A*. True, if *C* is not *B*, and *A* and *B* are contradictories.

(4) If *A* is not *B*, *C* is not *A*. True, if *C* is *B*.

3d. *The predicate of the condition is the subject of the consequent.*

(1) If *A* is *B*, *B* is *C*. True, if *A* is *C*, and is co-extensive with *B*.

(2) If *A* is *B*, *B* is not *C*. True, if *A* is not *C*, and is co-extensive with *B*.

(3) If *A* is not *B*, *B* is *C*. True, if *A* and *C* are contradictories.

(4) If *A* is not *B*, *B* is not *C*. True, if *C* is *A*.

4th. *The predicate of the condition is the predicate of the consequent.*

(1) If *A* is *B*, *C* is *B*. True, if *C* is *A*.

(2) If *A* is *B*, *C* is not *B*. True, if *C* is not *A*, and *A* is co-extensive with *B*.

(3) If *A* is not *B*, *C* is *B*. True, if *C* is not *A*, and *A* and *B* are contradictories.

(4) If *A* is not *B*, *C* is not *B*. True, if *C* is *A*.

5th. *The subjects and predicates are different in the antecedent and consequent.*

(1) If *A* is *B*, *C* is *D*. True, if *C* is *A* and *B* is *D*.

(2) If *A* is *B*, *C* is not *D*. True, if *C* is *A* and *B* is not *D*.

(3) If *A* is not *B*, *C* is *D*. True, if *A* and *B* are contradictories, and either *A* or *B* is in *D*, and *C* is not in the other.

(4) If *A* is not *B*, *C* is not *D*. True, if *C* is either *A* or *B*, and *D* is the other.

2. **Disjunctive judgments** are those which present alternatives. These alternatives are either *unexclusive* or *exclusive*.

1st. *Unexclusive alternatives* are of two kinds:

(1) When the alternatives are simply different words for the same thing. In this case, the judgment is disjunctive only in *expression*. Thus, this electricity is vitreous, or positive.

(2) When the alternatives are different but congruent things. Thus, this man is a knave or a fool; he may be both. Augustine was a saint or a philosopher; he was both.

2d. *Exclusive alternatives* have two forms, expressed,

(1) *In the copula.* Thus, *S* either is or is not *P*. This is equivalent to the proposition *S* is either *P* or *non-P*, which, as pure contradictory opposition, is true by the law of contradictories.

(2) *In the terms.* *a.* In the *subject.* Thus, either *R* or *S* is *P*.

*b. In the predicate.* *S* is either *P* or *Q*.

If *R* and *S* or *P* and *Q* are contradictories, we have contradictory opposition, and the judgment is true by the law of contradictories.

If *R* and *S* or *P* and *Q* are contraries, we have contrary opposition, and hence can not affirm the judgment *a priori*, but only *a posteriori*, by showing that all other contrary judgments are false. Then, the same inferences follow as in contradictory opposition; that is, one of the alternatives is true; if either is true, the other is false; if either is false, the other is true.

Such a proposition as angles are right or oblique is *divisive.* It does not mean that all angles are right or all angles are oblique; but that angles are divided into right angles and oblique angles; that is, that some angles are right and some oblique, or that any angle is either right or oblique, which is disjunctive, not only in expression, but in thought, and the alternatives are contradictories in the genus angles.

Alternatives may be contradictories within a limited sphere, but only contraries if the sphere be extended. Thus, *Vertebrates* and *invertebrates* are contradictories in the sphere of *animals;* but only *contraries* in the sphere of organic beings. Any animal is either a vertebrate or

an invertebrate, but it will not do to say that every organic being, much less, that every thing, is either a vertebrate or an invertebrate animal.

**3. The dilemmatic judgments** are divided into two groups, each containing four forms. Let the law of truth be given for each and illustrated with circles, according to Euler's notation.

1st. When the condition is *simple*,

(1) If $A$ is $B$, $S$ is either $P$ or $Q$.

(2) If $A$ is $B$, $S$ is neither $P$ nor $Q$.

(3) If $A$ is not $B$, $S$ is either $P$ or $Q$.

(4) If $A$ is not $B$, $S$ is neither $P$ nor $Q$.

2d. When the condition is *compound*.

(1) If either $A$ is $B$ or $C$ is $D$, $S$ is either $P$ or $Q$.

(2) If either $A$ is $B$ or $C$ is $D$, $S$ is neither $P$ nor $Q$.

(3) If neither $A$ is $B$ nor $C$ is $D$, $S$ is either $P$ or $Q$.

(4) If neither $A$ is $B$ nor $C$ is $D$, $S$ is neither $P$ nor $Q$.

The disjunctive consequent is in contrary opposition; for if in contradictory opposition, then, in either group, the consequents of (1) and (3) would be true and the consequents of (2) and (4) would be false by the law of contradictories, and the reason in the conditional clause would be redundant. Thus, it would be superfluous to say, if $A$ is $B$, $S$ is either $P$ or *non-P*, for $S$ is either $P$ or *non-P*, whether $A$ is $B$ or not.

## CHAPTER XIII.

### DEDUCTIVE REASONING.

**Reasoning** is the process by which the truth or falsity of a proposition is proved.

An *argument* is the derivation of a judgment from another judgment or from other judgments. It infers, in the final proposition, what was virtually contained in the preceding.

An *immediate argument* is an argument in which the relation of the terms of the derived proposition is inferred from another proposition, or from other propositions, without the intervention of a middle term.

The *varieties* of immediate arguments are the following:

1st. *Inferences from the relation of the four propositions*, (*A*), (*E*), (*I*), (*O*). See Chapter X.

(1) What inferences can be drawn from the truth of the proposition, (*A*), All *S* is *P*? from the falsity of (*A*)?

(2) What inferences can be drawn from the truth of the proposition (*E*), No *S* is *P*? from the falsity of (*E*)?

(3) What inferences can be drawn from the truth of the proposition (*I*), Some *S* is *P*? from the falsity of (*I*)?

(4) What inferences can be drawn from the truth of the proposition (*O*), Some *S* is not *P*? from the falsity of (*O*)?

2d. *Inferences from the conversion of the propositions*, (*A*), (*E*) (*I*), (*O*). See Chapter XI.

(1) What inferences from conversion can be drawn

from the proposition (*A*), in case of co-extension? in case of subordination? What from the proposition, Pentagons are polygons of five sides? What from the proposition, Pentagons are polygons?

(2) What inferences from conversion can be drawn from the proposition (*E*)? What from the proposition, No knowledge is useless?

(3) What inferences from conversion can be drawn from the proposition (*I*)? What from the proposition, Some men are liars?

(4) What inferences from conversion can be drawn from the proposition (*O*)? What from the proposition, Some men are not liars?

(5) State the contrary, the subaltern, and the contradictory of the proposition, All criminals deserve punishment.

(6) Classify the proposition, All just acts are expedient. What inferences can be drawn from it, by means of relation? What by means of conversion? Classify and convert these inferences.

(7) State and classify the propositions incompatible with the proposition, All liars are detestable. Convert each.

3d. *Inferences from model restriction.* The necessary, implies the actual; the actual, the probable; the probable, the possible. What inferences can be drawn from the proposition, Space is necessarily infinite?

4th. *Inferences from composition.* Thus, *A* is in *C; B* is in *C;* therefore, *A* and *B* are in *C.*

5th. *Inferences from divisive judgments.* Thus, *S* is *P*, *Q*, or *R;* therefore, the *P* of *S* is neither the *Q* nor the *R* of *S;* the *non-P* of *S* is either the *Q* or the *R* of *S;* the neither *P* nor *Q* of *S* is the *R* of *S.*

6th. *Inferences by means of privatives.*

(1) All *S* is *P;* therefore, No *S* is *non-P*, and all

*non-P* is *non-S*. Also, from the proposition, All *non-S* is *non-P*, we infer, No *non-S* is *P*, and all *P* is *S*.

(2) Infer, by means of privatives, the conclusion from the proposition, No *S* is *P*; from, No *non-S* is *non-P*.

(3) What inference, by means of privatives, can be drawn from the proposition, Some *S* is *P*? From, Some *non-S* is *non-P*?

(4) What inference, by means of privatives, can be drawn from the proposition, Some *S* is not *P*? From, Some *non-S* is not *non-P*?

7th. *Inferences by means of determinants.* This class of inferences consists in joining the same modifier to both subject and predicate. Thus, An Indian is a fellow creature; therefore, A happy Indian is a happy fellow creature. Inferences of this kind are often fallacious. Thus, A president is a man; therefore, An incompetent president is an incompetent man. A dwarf is a man; therefore, A big dwarf is a big man. The inference is valid in case of co-extension, or when the modifier does not affect the characteristics of the subject.

8th. *Inferences by means of complex conceptions.* This class is clearly allied to the last. Thus, Metals are elements; therefore, A mixture of metals is a mixture of elements. Inferences of this kind are often fallacious. Thus, Americans are human beings; therefore, A majority of Americans is a majority of human beings.

## CHAPTER XIV.

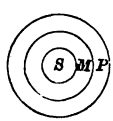
### DEDUCTIVE REASONING.

**A mediate argument** is an argument in which the relation of the terms of the derived proposition is inferred from other propositions through the intervention of a middle term.

The derived proposition is called the *conclusion.* The propositions from which the conclusion is inferred are called the *premises.*

A *syllogism* is an argument in regular form.

Thus,
$$\begin{cases} \text{All } M \text{ is } P. \\ \text{All } S \text{ is } M. \\ \therefore \text{ All } S \text{ is } P. \end{cases}$$




A syllogism contains *three terms :* two extremes—the major term and the minor term—and the middle term.

The *major term*, $P$, is the predicate of the conclusion; the *minor term*, $S$, is the subject of the conclusion; and the *middle term*, $M$, is the medium of comparison.

A syllogism contains three propositions: two premises—the major premise and the minor premise—and the conclusion.

The *major premise* is the premise which expresses the relation of the middle term, $M$, to the major term, $P$.

The *minor premise* is the premise which expresses the relation of the minor term, $S$, to the middle term, $M$.

The conclusion is the proposition which expresses the

relation of the minor term to the major, as inferred from the premises.

As an illustration of an argument, take the following:

All responsible agents are free agents.
Man is a responsible agent.
∴ Man is a free agent.

Man and a free agent, the subject and the predicate of the conclusion, are the extremes,—a free agent, the predicate, is the major term, and man, the subject, is the minor. The term, responsible agents, with which the extremes are separately compared in the premises, is the middle term, and is in both premises, but not in the conclusion.

All responsible agents are free agents, the premise which expresses the relation of the middle term to the major term, is the major premise Man is a responsible agent, the premise which expresses the relation of the minor term to the middle, is the minor premise.

In *extensive quantity*, the class responsible agents is subordinate to the class free agents; the class man is subordinate to the class responsible agents; hence the class man is subordinate to the class free agents, according to the principle, a subordinate to a class is subordinate to any genus embracing that class, or, as it may be stated, a part of a part is a part of the whole.

In *comprehensive quantity*, the class responsible agents comprehends free agency as an element of responsibility; the class man comprehends responsibility as one of its attributes; hence, the class man comprehends free agency as an attribute, on the principle that the whole comprehends a part of a part.

It is to be observed that the term greatest in extension is least in comprehension; and that the term least in extension is greatest in comprehension.

The names, major and minor terms, are significant only in extensive quantity; but even in this quantity, the major term, as a matter of fact, as we shall hereafter see, is frequently less in extension than the minor term. These names are, therefore, to be regarded as mere technical expressions, the major term denoting the predicate of the conclusion, and the minor, the subject.

The expressions, major and minor premises, are also to be regarded as technical expressions, the major premise being the premise containing the major term, and the minor premise the premise containing the minor term.

The order of the premises is not essential, though the major premise generally stands first. The conclusion may even stand before the premises.

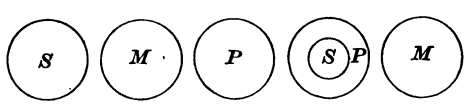
The *function* of an argument is to prove that a certain relation exists between two terms, when that relation is not self-evident.

In mediate arguments, this is accomplished by selecting, as the medium of comparison, a third term, called the middle term, with which the other terms are separately compared. The relations of the extreme terms to the middle term prove the relation of the extremes to each other.

The conclusion must not only be *compatible* with the premises, but must be necessitated by them, otherwise the argument is a *fallacy.*

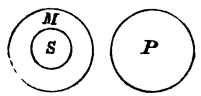
This is shown in the following argument and illustrations. The conclusion may be accidentally true, as shown in the first set of circles, but it is not necessitated by the premises, as shown by the second set.

No *M* is *P.*
No *S* is *M.*
∴ No *S* is *P.*



**The same relations may have different expressions:**

No *M* is *P*.
All *S* is *M*.
∴ No *S* is *P*.




No *P* is *M*.
All *S* is *M*.
∴ No *S* is *P*.

These arguments are identical in thought, as is seen by the circles, with an accidental difference of expression.

Does the syllogism *beg* the question? It has been asserted, by John Stuart Mill and others, that the syllogism involves the fallacy called *petitio principii*, the begging of the question. This charge is made, not in the sense that in all valid syllogisms the premises virtually assert the conclusion,—for this they must do, otherwise the argument is a fallacy,—but, in the sense that the conclusion, so far from being deduced from the premises, must be known to be true before the major premise can be established; but as the conclusion is not known to be true, the very thing to be proved is begged in the major premise, thus:

All men are mortal.
Gabriel is a man.
∴ Gabriel is mortal.

Mill says: "That we can not be assured of the mortality of all men, unless we were previously certain of the mortality of every individual man; that if it be still doubtful whether Socrates, or any other individual you choose to name, be mortal or not, the same degree of uncertainty must hang over the assertion, All men are mortal."

The warrant for the major premise, All men are mortal, is not found in the fact that Gabriel is mortal; for we may be totally ignorant even of the existence of Gabriel. Much less is the major premise a case of so-

called perfect induction, established by an examination of every individual man, which is impossible in the nature of the case; and, yet, after examining a multitude of cases, we are warranted in asserting that all men are mortal, as an induction of a very high degree of probability.

Neither is the warrant for the conclusion, Gabriel is mortal, found only in the major premise, All men are mortal; for Gabriel may be an angel. We must also know that Gabriel is a man. Then, without begging the question, the conclusion, Gabriel is mortal, follows logically from the premises, but with no higher probability than the major premise.

The syllogism is based on classification; and classification, on the law of *Reason and Consequent*. An examination of a great number of individuals of the human race reveals sufficient reason for concluding that, in the present condition of man, mortality is the law, or general fact, of humanity.

Again, suppose I find a plant of a class which I have never before seen, and am desirous of knowing the character of its fruit, if indeed it bear fruit, not at present having any. I examine the plant according to the methods of botany, and find it to belong to a certain class. Reading a further description of the class, I find the character of the fruit which plants of this kind bear. I then reason thus:

Plants of this class bear a certain kind of fruit.
This plant belongs to this class.
∴ This plant bears this kind of fruit.

This process is legitimate, and the conclusion is an important extension of my knowledge.

But how do botanists know that plants of this kind bear such fruit? Surely not because they have seen

this plant bear such fruit; but because they have seen a great many specimens of this kind of plants bear such fruit, and have found no exceptions; that is, they have found no plants of this kind bearing a different species of fruit.

Again, suppose we wish to know how many diagonals can be drawn in a *chiliagon*, a polygon of a thousand sides. It would not be practicable to draw all the diagonals and then count them; for they are too numerous; but the proper thing to do is to find a general formula for the number of diagonals that can be drawn in a polygon of $n$ sides. This formula is not found by induction, that is, by finding the number of diagonals that can be drawn in polygons of four, five, six, etc., sides; but by reasoning thus:

Since the polygon has $n$ sides, it has $n$ vertices. Now, from any vertex, a diagonal can be drawn to any vertex except itself and the two adjacent vertices; hence, from each vertex, $n$–3 diagonals can be drawn, and therefore from the $n$ vertices, $n$ times $n$–3, or $n(n\text{–}3)$ diagonals can be drawn; but in this way, each diagonal is counted twice; hence the number of diagonals is $\frac{1}{2}\, n\,(n\text{–}3.)$

This formula has been established without any reference to the chiliagon. Now, we reason thus: The number of diagonals that can be drawn in a polygon of $n$ sides is $\frac{1}{2}\, n\,(n\text{–}3)$, whatever be the value of $n$; but, in a chiliagon, $n = 1000$; hence, the number of diagonals that can be drawn in a chiliagon is $500 \times 997 = 498500$. Where is there even a shadow of *petitio principii* here?

Again, suppose I stand on the lake shore and see a vessel sink with all on board. Now, need I know that John Jones was drowned to know that all on board were drowned? I may not even know that John Jones was aboard. The next day, however, I learn from wit-

nesses who saw the vessel leave a neighboring port that John Jones was aboard. Then I reason thus:

All on board a certain vessel at a certain time were drowned.

John Jones was on board that vessel at that time.

∴ John Jones was drowned.

There is no begging of the question here, since I knew the truth of the major premise before knowing the truth of the conclusion. The minor premise is as essential to the truth of the conclusion as the major; but if the two premises be admitted, the conclusion can not logically be denied.

An *enthymeme* is an argument with one proposition, either of the premises or the conclusion, suppressed, thus:

All men are mortal. ∴ You are mortal.
You are a man. ∴ You are mortal.
All men are mortal. You are a man.

Such reasonings are common. The last form is impressive, as it leaves the hearer to draw his own conclusion.

## CHAPTER XV.

### DEDUCTIVE REASONING.

**Categorical syllogisms** are those in which the propositions — the two premises and the conclusion — are categorical. They are simple or compound.

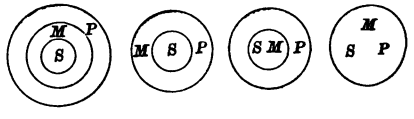
**1. Simple categorical syllogisms** are those which contain only three terms and three propositions. The three terms are the two extremes — the major term, or the predicate of the conclusion; and the minor term, or the subject of the conclusion; and the middle term, or the medium of comparison. The three propositions are the two premises — the major premise, or the premise containing the major term and the middle term; and the minor premise containing the minor term and the middle term; and the conclusion containing the major term and the minor term.

*Laws* warranting the conclusions, (*A*), (*E*), (*I*), (*O*).

1st. *The universal affirmative conclusion* (*A*) *is warranted, if all the middle term is contained in the major, and all the minor in the middle.*

This general principle holds whether the relations expressed be those of subordination or co-extension, as thus shown:

All *M* is *P*.
All *S* is *M*.
∴ All *S* is *P*.




2d. *The universal negative conclusion* (*E*) *is warranted,*

*if all of either extreme is contained in the middle and all of the other is excluded from the middle.*

This general principle holds whether the relation in the affirmative premise be one of subordination or co-extension, and whether the terms in the negative premise are contraries or contradictories. Illustrate by circles.

| | |
|---|---|
| All *P* is *M*. | No *P* is *M*. |
| No *S* is *M*. | All *S* is *M*. |
| ∴ No *S* is *P*. | ∴ No *S* is *P*. |

3d. *The particular affirmative conclusion (I) is warranted, if all the middle is contained in both extremes, or if all the middle is contained in either extreme, and a part of the middle in the other.*

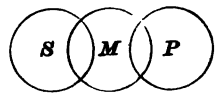
In both cases, the same thing — either all or the same part of the middle—is contained in both extremes; hence, the extremes must, in part at least, coincide with each other, or a particular affirmative conclusion, at least, is warranted.

These principles hold, whether the relations in the universal premises be those of subordination or co-extension, or the relation in the particular premise be that of co-extension, or intersection, or subordination, whichever term be subordinate to the other. Illustrate:

| | | |
|---|---|---|
| All *M* is *P*. | All *M* is *P*. | Some *M* is *P*. |
| All *M* is *S*. | Some *M* is *S*. | All *M* is *S*. |
| ∴ Some *S* is *P*. | ∴ Some *S* is *P*. | ∴ Some *S* is *P*. |

If both premises be particular, that is, if some of the middle is contained in the major term, and some in the minor, it will not be known that it is the *same* some; the same thing, then, will not be known to be in both extremes, and there will be no warrant for the conclusion. The argument will then be a fallacy, thus:

Some $M$ is $P$.
Some $M$ is $S$.
$\therefore$ Some $S$ is $P$.




If, however, a part of the middle is contained in one extreme, and more than the complementary part in the other, the same thing — a part of the middle — is contained in each extreme, and the argument is valid, thus:

Two thirds of $M$ is $P$.
More than one third of $M$ is $S$.
$\therefore$ Some $S$ is $P$.

If, at a certain election, a majority of the electors voted for $A$, and a majority voted for $B$, then some who voted for $A$, voted for $B$.

4th. *The particular negative conclusion ($O$) is warranted if all the major term is excluded from the middle, and some of the minor is contained in the middle; or, if all the major is contained in the middle, and some of the minor is excluded from the middle; or, if all the middle is contained in the minor, and some of the middle is excluded from the major.*

These principles hold for all possible relations of the terms in the premises, and in each case some of the minor, at least, will be excluded from the major. Illustrate:

| | | |
|---|---|---|
| No $P$ is $M$. | All $P$ is $M$. | Some $M$ is not $P$. |
| Some $S$ is $M$. | Some $S$ is not $M$. | All $M$ is $S$. |
| $\therefore$ Some $S$ is not $P$. | $\therefore$ Some $S$ is not $P$. | $\therefore$ Some $S$ is not $P$. |

**2. A compound syllogism** is a combination of simple syllogisms. There are several varieties.

1st. The compound syllogism, composed of a *prosyllogism* and an *episyllogism* — the conclusion of the prosyllogism being one of the premises of the episyllogism, thus:

Prosyllogism { All *B* is *A*. / All *C* is *B*. / ∴ All *C* is *A*. } Episyllogism { All *D* is *C*. / ∴ All *D* is *A*. }

2d. An *epichirema* is a syllogism in which the reasons for the premises are stated in connection with them, thus:

(1) All true patriots are friends to religion, because religion is the basis of national prosperity. Some great statesmen are not friends to religion, because their lives are not in accordance with its precepts. Therefore, some great statesmen are not true patriots.

(2) { *A* is *B*, for *A* is *C* and *C* is *B*. / *D* is *A*, for *D* is *E* and *E* is *A*. / ∴ *D* is *B*. }

3d. The *sorites*, or chain syllogism, is a compound argument which may be indefinitely extended. There are several varieties which may be illustrated by circles.

(1) When the predicate of each premise is the subject of the next.

Affirmative { All *A* is *B*. / All *B* is *C*. / All *C* is *D*. / ∴ All *A* is *D*. }

Negative { All *A* is *B*. / All *B* is *C*. / No *C* is *D*. / ∴ No *A* is *D*. }

(2) When the subject of each premise is the predicate of the next.

Affirmative { All *B* is *A*. / All *C* is *B*. / All *D* is *C*. / ∴ All *D* is *A*. }

Negative { No *B* is *A*. / All *C* is *B*. / All *D* is *C*. / ∴ No *D* is *A*. }

(3) When the first and second varieties are combined.

| | | | |
|---|---|---|---|
| Negative | All *A* is *B*.<br>All *B* is *C*.<br>No *C* is *D*.<br>All *E* is *D*.<br>All *F* is *E*.<br>All *G* is *F*.<br>∴ No *A* is *G*. | Negative | All *A* is *B*.<br>All *B* is *C*.<br>All *G* is *D*.<br>No *E* is *D*.<br>All *F* is *E*.<br>All *G* is *F*.<br>∴ No *A* is *G*. |

The laws of the sorites are the following:

(1) Only one premise can be particular—the first in the first variety, the last in the second, and the first or last in the third—and the subject of the particular premise is the subject of the conclusion.

(2) Only one premise can be negative—the last in the first variety, or the first in the second variety.

(3) In the third variety, one premise must be negative—the last in the first series, or the first in the second series.

The *expansion* of the sorites is thus effected. Illustrate by circles.

(1) All *A* is *B*.<br>All *B* is *C*.<br>All *C* is *D*.<br>∴ All *A* is *D*.

=

All *A* is *B*.<br>All *B* is *C*.<br>∴ All *A* is *C*.

All *C* is *D*.<br>All *A* is *C*.<br>∴ All *A* is *D*.

It will be observed that the minor premise stands first in the first simple syllogism, and the major in the second.

This order might, in either or both cases, have been reversed; hence, the order of the premises is not essential.

(2) Expand each of the examples above given to illustrate the varieties.

(3) Expand the following concrete example:

The mind is a thinking substance.
A thinking substance is a spirit.
A spirit has no composition of parts.
That which has no composition of parts is indissoluble.
That which is indissoluble is immortal.
Therefore, the mind is immortal.

## CHAPTER XVI.

### DEDUCTIVE REASONING.

**Conditional Syllogisms** are divided into three classes —Hypothetical, Disjunctive, and Dilemmatic.

**1. The hypothetical syllogism** is a syllogism having an hypothetical major premise and a categorical minor. Its form is, therefore, determined by the law of Reason and Consequent.

The hypothetical syllogism is said to be *constructive*, or *modus ponens*, the mood which posits or affirms, when the minor premise affirms the condition, and the conclusion the consequent,—and *destructive*, or *modus tollens*, the mood which removes or denies, when the minor premise denies the consequent, and the conclusion the condition.

The *rule* to be observed is that the antecedent condition is to be affirmed in the minor premise and the consequent in the conclusion, or the consequent is to be denied in the minor premise and the condition in the conclusion. The following are illustrations:

Constructive
If *A* has the fever, he is sick.
But *A* has the fever.
Therefore, *A* is sick.

Destructive
If *A* has the fever, he is sick.
But *A* is not sick.
Therefore, *A* has not the fever.

If the rule be violated, by either denying the antece-

dent in the minor premise or affirming the consequent, nothing follows, thus:

If *A* has the fever, he is sick.
But *A* has not the fever.

It does not follow that *A* is not sick; for he may have some other disease, and hence be sick. It would, however, follow that *A* is not sick, if fever were co-extensive with sickness.

If *A* has the fever, he is sick.
But *A* is sick.

It does not follow that *A* has the fever; for his sickness may be the result of some other disease. It would, however, follow that *A* has the fever, if fever were co-extensive with sickness.

The *analysis* of the hypothetical syllogism, therefore, gives the following results:

1st. The major premise is an hypothetical proposition, enouncing the dependency between a conditioning antecedent and a conditioned consequent, but affirming nothing in regard to the actual existence of either.

2d. The minor premise is a categorical proposition, either affirming the conditioning antecedent or denying the conditioned consequent.

3d. The conclusion is a categorical proposition, affirming the consequent, if the antecedent is affirmed in the minor premise, or denying the antecedent if the consequent is denied in the minor premise.

4th. There is no conclusion, when either the antecedent is denied in the minor premise, or the consequent is affirmed, unless the predicate of the antecedent is co-extensive with the predicate of the consequent.

The *reduction* of hypothetical syllogisms to categorical

is effected by substituting for the major premise the condition of its truth, as determined in Chapter XII. Thus, the condition of the truth of the proposition, If *A* is *B*, *A* is *C*, is the proposition, *B* is *C*. Hence the reduction:

$$\text{Constructive} \begin{cases} \text{If } A \text{ is } B, A \text{ is } C. \\ \text{But } A \text{ is } B. \\ \therefore A \text{ is } C. \end{cases} = \begin{cases} B \text{ is } C. \\ A \text{ is } B. \\ \therefore A \text{ is } C. \end{cases}$$

Illustrate the above by circles, also the following:

$$\text{Destructive} \begin{cases} \text{If } A \text{ is } B, A \text{ is } C. \\ \text{But } A \text{ is not } C. \\ \therefore A \text{ is not } B. \end{cases} = \begin{cases} B \text{ is } C. \\ A \text{ is not } C. \\ \therefore A \text{ is not } B. \end{cases}$$

$$\text{Constructive} \begin{cases} \text{If } A \text{ is } B, C \text{ is } D. \\ \text{But } A \text{ is } B. \\ \therefore C \text{ is } D. \end{cases} = \begin{cases} \begin{cases} A \text{ is } B. \\ C \text{ is } A. \\ \therefore C \text{ is } B. \end{cases} \\ \\ \begin{cases} B \text{ is } D. \\ C \text{ is } B. \\ \therefore C \text{ is } D. \end{cases} \end{cases}$$

$$\text{Destructive} \begin{cases} \text{If } A \text{ is } B, C \text{ is } D. \\ \text{But } C \text{ is not } D. \\ \therefore A \text{ is not } B. \end{cases} = \begin{cases} \begin{cases} \text{B is } D. \\ C \text{ is not } D. \\ \therefore C \text{ is not } B. \end{cases} \\ \\ \begin{cases} C \text{ is } A. \\ C \text{ is not } B. \\ \therefore \text{Some } A \text{ is not } B. \end{cases} \end{cases}$$

The last constructive syllogism may be thus reduced:

The case of *A* being *B*, is the case of *C* being *D*.
The present case is the case of *A* being B.
∴ The present case is the case of C being *D*.

Construct hypothetical syllogisms having for major premises the hypothetical propositions of Chapter XII. Reduce them to categorical by employing the conditions of their truth as premises.

**2. The disjunctive syllogism** is a syllogism having a disjunctive major premise, and a minor premise in which the number of alternatives is reduced.

1st *When there are only two alternatives.* In this case, the form is determined by the law of contradictories.

There are two moods:—the *affirmative*, or *modus ponendo tollens*, the mood which by affirming denies, when the minor premise affirms one of the alternatives, and the conclusion denies the other,—and the *negative*, or *modus tollendo ponens*, the mood which, by denying, affirms, when the minor premise denies one of the alternatives. and the conclusion affirms the other:

The following is the *modus ponendo tollens:*

*A* is either B or C.
But *A* is B.
∴ *A* is not C.

The *modus ponendo tollens* proceeds on the supposition that there is opposition, contradictory or contrary, between the alternatives. If the opposition is *contradictory*, the major premise is known, *a priori*, to be valid; but if the opposition is contrary, the truth of the major premise is determined *a posteriori*. In either case, if one alternative is affirmed, the other must be denied.

If there is no opposition between the alternatives, the affirmation of one does not involve the denial of the other. Thus, if we say: "A good book is valued either for the usefulness of its contents or the excellence of its style," it does not follow that if valued for the usefulness of its contents, it is not valued for the excellence

of its style. These alternatives are not in opposition, and the book may be valued both for the usefulness of its contents and for the excellence of its style.

The alternatives are always diverse, but may be either congruents or conflictives, which are the two species embraced by the genus diverse things.

The following is the *modus tollendo ponens:*

*A* is either *B* or *C.*
But *A* is not *B.*
∴ *A* is *C.*

The book is valued either for the usefulness of its contents or the excellence of its style. But it is not valued for the usefulness of its contents; therefore, it is valued for the excellence of its style. This will be a true conclusion, if the major premise be true, whether there is opposition between the alternatives or not.

The *analysis* of the disjunctive syllogism in the case considered, therefore, gives the following results:

(1) The major premise is a disjunctive proposition expressing two alternatives.

(2) The minor premise is a categorical proposition affirming or denying one alternative.

(3) The conclusion is a categorical proposition denying one alternative, if the minor premise affirms the other, and if the alternatives are conflictives, or affirming one alternative, if the minor premise denies the other, whether the alternatives are congruents or conflictives.

(4) If the alternatives are not conflictives, the *modus ponendo tollens* fails, but the *modus tollendo ponens* is still valid.

2d. *When there are more than two alternatives.* In this case the minor premise may be either categorical or disjunctive, thus:

Affirmative

*A* is either *B*, *C*, *D*, or *E*.
But *A* is *B*.
∴ *A* is neither *C*, *D*, nor *E*.

*A* is either *B*, *C*, *D*, or *E*.
But *A* is either *B* or *C*.
∴ *A* is neither *D* nor *E*.

Negative

*A* is either *B*, *C*, *D*, or *E*.
But *A* is neither *B*, *C*, nor *D*.
∴ *A* is *E*.

*A* is either *B*, *C*, *D*, or *E*.
But *A* is neither *B* nor *C*.
∴ *A* is either *D* or *E*.

The *laws* applying to more than three conflictive alternatives are the following:

(1) Affirming a part of the disjunctives, determinately or indeterminately, in the minor premise, denies all the others in the conclusion if the alternatives are conflictives, but not if the alternatives are congruents.

(2) Denying a part of the alternatives in the minor premise, affirms the rest, in conclusion, determinately or indeterminately, according as one or more remain, whether the alternatives are conflictives or congruents.

If the minor premise neither affirms nor denies an alternative, but affirms something to be contained in the subject, the conclusion is disjunctive, thus:

*B* is either *C* or *D*.
*A* is *B*.
∴ *A* is either *C* or *D*.

This syllogism is, in thought, categorical.

**3. The dilemmatic syllogism** is a syllogism having an hypothetical major premise and a disjunctive minor.

There are at least four forms, as follows:

1st. *The simple constructive dilemma.* The major premise has different antecedents and the same consequent; the minor premise disjunctively affirms the antecedents; and the conclusion affirms the consequent, thus:

If $A$ is $B$, $X$ is $Y$.
If $C$ is $D$, $X$ is $Y$.
If $E$ is $F$, $X$ is $Y$.
But either $A$ is $B$, or $C$ is $D$, or $E$ is $F$. $\therefore X$ is $Y$.

If the minor premise had been, $X$ is not $Y$, the conclusion would have been, $A$ is not $B$, $C$ is not $D$, and $E$ is not $F$. This is virtually a destructive hypothetical syllogism, but is not strictly dilemmatic, since the minor premise is not a disjunctive proposition.

2d. *The simple destructive dilemma.* The major premise has the same antecedent and different consequents; the minor premise disjunctively denies the consequents; and the conclusion denies the antecedent, thus:

If $A$ is $B$, $C$ is $D$.
If $A$ is $B$, $E$ is $F$.
If $A$ is $B$, $G$ is $H$.
But either $C$ is not $D$, or $E$ is not $F$, or $G$ is not H. $\therefore A$ is not $B$.

If the minor premise had been $A$ is $B$, the conclusion would have been, $C$ is $D$, $E$ is $F$, and $G$ is $H$, which is virtually a constructive hypothetical syllogism but not dilemmatic.

3d. *The complex constructive dilemma.* The major premise has different antecedents and different consequents; the minor premise disjunctively affirms the antecedents; and the conclusion disjunctively affirms the consequents, thus:

If $A$ is $B$, $G$ is $H$.
If $C$ is $D$, $J$ is $K$.
If $E$ is $F$, $L$ is $M$.
But either $A$ is $B$, or $C$ is $D$, or $E$ is $F$.
$\therefore$ Either $G$ is $H$, $J$ is $K$, or $L$ is $M$.

4th. *The complex destructive dilemma.* The major premise has different antecedents and different consequents; the minor premise disjunctively denies the consequents; and the conclusion disjunctively denies the antecedents, thus:

If $A$ is $B$, $G$ is $H$.
If $C$ is $D$, $J$ is $K$.
If $E$ is $F$, $L$ is $M$.
But either $G$ is not $H$, or $J$ is not $K$, or $L$ is not $M$.
$\therefore$ Either $A$ is not $B$, $C$ is not $D$, or $E$ is not $F$.

To which class does the following dilemma belong?

If a science furnishes useful facts, it is worthy of cultivation; if the study of it exercises the reasoning powers, it is worthy of cultivation; but a science either furnishes useful facts, or its study exercises the reasoning powers; therefore, it is worthy of cultivation.

**4. The reductio ad absurdum** is an indirect argument which, by employing some form of the conditional syllogism, proves a proposition to be true by showing that the supposition that it is false involves an absurdity. It is based on the harmony of truth.

There are two cases of the *reductio ad absurdum:*

1st. When only two relations are possible—one expressed by the given proposition, and the other by its contradictory.

In this case, either the given proposition or its contradictory is true. The given proposition is proved true by assuming that it is false, or, which is virtually the same, that its contradictory is true. We then reason on this assumed proposition till we reach a conclusion conflicting with a known truth, and hence absurd. Therefore, the assumed proposition, which led to this absurdity, is false, and if false, its contradictory, or the given proposition, is true, and is hence demonstrated.

Thus, of two unequal quantities, $a$ and $b$, we can prove that $a > b$, if we can show that the supposition, $a < b$, involves an absurdity.

2d. When more than two relations are possible—one expressed by the given proposition, and the others by its contraries. In this case, the given proposition, or some one of its contraries, is true. The given proposition is proved true, by assuming that it is false, or, which is virtually the same, that some one of the contraries is true. We then show that each of these contraries is false, because involving an absurdity; but the falsity of all the contraries implies the truth of the given proposition, which is, therefore, demonstrated. Thus, we can prove that $a = b$, if we can show that each of the suppositions, $a > b$ and $a < b$, involves an absurdity.

In dealing with the second case, care must be taken that all possible contraries are considered. If a possible contrary is omitted, the conclusion is vitiated.

As an example of this method, prove that *the side opposite the greater of two unequal angles of a triangle is greater than the side opposite the less*,—having first proved that *the angles opposite the equal sides of an isosceles triangle are equal*, and that *the angle opposite the greater of two unequal sides of a triangle is greater than the angle opposite the less.*

## CHAPTER XVII.

### DEDUCTIVE REASONING.

**A formal fallacy** is a fallacy which, in its form, violates some law of thought. It is also called a *paralogism*, or a fallacy *in dictione* or *in voce*.

**1. Classification and Illustrations.**—There are several varieties.

1st. A *paradox*, or violation of a fundamental law of thought. It is self-contradictory, and, when explicitly stated, is at once detected. Thus, *A* is *non-A*. A part is greater than the whole, etc.

2d. *Fallacies in immediate inferences.* The varieties are:

(1) *Fallacies in the relation of the propositions*, (*A*), (*E*), (*I*), (*O*). Thus, inferring from the falsity of either (*A*) or (*E*), the truth of the other; from the truth of either (*I*) or (*O*), the falsity of the other; from the falsity of (*A*), the falsity of (*I*); from the truth of (*I*), the truth of (*A*); from the falsity of (*E*), the falsity of (*O*); from the truth of (*O*), the truth of (*E*).

(2) *Fallacies in conversion.* Thus, All *S* is *P*; ∴ All *P* is *S*. All seeds come from plants; ∴ All plants come from seeds. Some *S* is not *P*; Some *P* is not *S*. Some animals are not horses; ∴ Some horses are not animals.

(3) *Fallacies in extending modal restriction.* Thus, *S* is possibly *P*; ∴ *S* is probably *P*. *S* is probably *P*; ∴ *S* is actually *P*. *S* is actually *P*; ∴ *S* is necessarily *P*.

(4) *Fallacies from composition.* Thus, *A* and *B* are *C*; ∴ *A* is *C*. In numbers, this fallacy is apparent, as 3 and 2 are 5; ∴ 3 is 5.

(5) *Fallacies from determinants.* Thus, a pony is a horse; ∴ A big pony is a big horse.

3d. *Fallacies in mediate inferences.* There are several varieties:

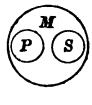
(1) *Undistributed middle.* This fallacy consists in comparing each of the extremes with a part of the middle, and, as it is not certain that it is the same part, the extremes are not known to be compared with the same thing, and hence there is no warrant for inferring their relations to each other. It will suffice, however, if the middle term be distributed in one of the premises.

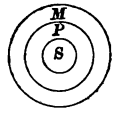
Let it be remembered that a term is distributed, if it is either the subject of a universal proposition or the predicate of a negative; and that a term is to be regarded as undistributed, if it is either the subject of a particular proposition or the predicate of an affirmative.

In a valid argument, the conclusion is not only compatible with the premises, but is necessitated by them, otherwise the argument is a fallacy.

Take an argument with an undistributed middle:

All *P* is *M*.
All *S* is *M*.
∴ All *S* is *P*.




The middle term is undistributed, since in each term it is the predicate of an affirmative. The conclusion does not necessarily follow from the premises, as seen from the first diagram; but it may be accidentally true, as seen from the second, yet the argument is no less a fallacy, since the conclusion is not necessitated.

If the relation in the major premise is known to be that of co-extension, in which case the conclusion is true, the argument can be relieved from the appearance

of fallacy by converting the major premise, as is admissible in case of co-extension, thus:

All *M* is *P*.
All *S* is *M*.
∴ All *S* is *P*.

What is the fallacy in the following argument?

Every country under a tyranny is distressed.
This country is distressed.
∴ This country is under a tyranny.

(2) *Illicit process.* This fallacy consists in distributing either the major or minor term in the conclusion, when it is not distributed in its premise. Take the following argument:

All *M* is *P*.
No *S* is *M*.
∴ No *S* is *P*.

*P* is distributed in the conclusion, since it is the predicate of a negative, but is undistributed in the major premise, since it is the predicate of an affirmative; hence, we have an illicit process of the major term. Show the fallacy by circles. Take also the following:

All *M* is *P*.
All *M* is *S*.
∴ All *S* is *P*.

*S* is distributed in the conclusion, since it is the subject of a universal, but it is undistributed in the minor premise, since it is the predicate of an affirmative; hence, we have an illicit process of the minor term. Show the fallacy by circles.

(3) *Particular premises.* This name aids in detecting certain fallacies, since we know at once that there is a fallacy, when each of the premises begins with the word *some;* but this case is not another class of fallacies, since, it involves either the undistributed middle, or an illicit

process. Show this in the following, and illustrate by circles:

| | |
|---|---|
| Some *P* is *M*. | Some *M* is *P*. |
| Some *S* is *M*. | Some *S* is not *M*. |
| ∴ Some *S* is *P*. | ∴ Some *S* is not *P*. |

(3) *A universal conclusion and one particular premise.* This involves either an undistributed middle or an illicit process. Show this in the following, and illustrate by circles:

| | |
|---|---|
| Some *M* is *P*. | All *M* is *P*. |
| All *S* is *M*. | Some *S* is not *M*. |
| ∴ All *S* is *P*. | ∴ Some *S* is not *P*. |
| Some *M* is not *P*. | Some *M* is not *P*. |
| All *M* is *S*. | All *S* is *M*. |
| ∴ No *S* is *P*. | ∴ No *S* is *P*. |

(5) *Negative premises.* In this case, no conclusion is warranted; for the denial of certain relations between the middle term and the extremes, warrants neither the affirmation nor denial of any relation between the extremes. Thus, show the fallacy of the following by circles:

| | |
|---|---|
| No *P* is *M*. | Some *M* is not *P*. |
| No *S* is *M*. | No *S* is *M*. |
| ∴ No *S* is *P*. | ∴ Some *S* is not *P*. |

(6) *An affirmative conclusion and one negative premise.* The affirmative premise expresses the agreement, in whole or in part, of one of the extremes with the middle; and the negative premise, the disagreement of the other extreme with the middle; hence, if any relation of the extremes follows, it is that of disagreement, or the

conclusion is negative. Show the fallacy of the following by circles:

| | |
|---|---|
| No *M* is *P*. | No *M* is *P*. |
| All *S* is *M*. | Some *S* is *M*. |
| ∴ All *S* is *P*. | ∴ Some *S* is *P*. |

(7) *A negative conclusion from affirmative premises.* Both extremes agree in whole or in part with the middle, and hence if any relation is warranted, the extremes must agree with each other, or the conclusion is affirmative.

Show the fallacy of the following by circles:

| | |
|---|---|
| All *M* is *P*. | All *M* is *P*. |
| All *S* is *M*. | Some *S* is *M*. |
| ∴ No *S* is *P*. | ∴ Some *S* is not *P*. |

(8) *Fallacies in hypothetical syllogisms.* This fallacy arises either when we deny the condition in the minor premise, and the consequent in the conclusion, or when we affirm the consequent in the minor premise, and the condition in the conclusion.

The following is an example of the first kind:

If this man has stolen, he is immoral.
But he has not stolen.
∴ He is not immoral.

The following is an example of the second kind:

If this man has stolen, he is immoral.
But he is immoral.
∴ He has stolen.

(9) *Fallacies in disjunctive syllogisms.* This fallacy arises when, in case there is no conflict between the al-

ternatives, we affirm one in the minor premise and deny the other in the conclusion.

The following example will illustrate:

This science is valued either for knowledge or for discipline.

It is valued for knowledge.

∴ It is not valued for discipline.

It may be valued for both knowledge and discipline.

(10) *Fallacies in dilemmatic syllogisms.* These are analogous to those in the hypothetical syllogism, and consist in denying the condition, and hence the consequent, or in affirming the consequent, and hence the condition.

(11) *Fallacy of four terms.* The use of *four terms* in a syllogism involves a fallacy nicknamed the *logical quadruped.* In this case, there are either two middle terms, and the extremes are separately compared with different things, thus affording no warrant for inferring their relations to each other, or there is a term in the conclusion not found in either premise, in which case one extreme is not compared with the middle, and hence its relation to the other extreme can not be inferred.

The fallacy in this form is too glaring to deceive; hence, it generally assumes the form called the fallacy of equivocation — the same word being used with two distinct meanings. There are apparently but *three* terms, though in reality *four.*

Any one of the three terms, the major, the minor, or the middle, is liable to be equivocal, but it is more frequently the middle term which is thus used in a double sense. In this case, the fallacy is called the fallacy of the *ambiguous middle.* The following are illustrations:

Light is contrary to darkness.

Feathers are light.
∴ Feathers are contrary to darkness.

All criminal actions ought to be punished by law.
Prosecutions for theft are criminal actions.
∴ Prosecutions for theft ought to be punished by law.

(12) *Fallacy of amphibology.* This fallacy consists in the use of an ambiguous grammatical construction. Thus, the conclusion depending on the interpretation of the proposition, "The duke yet lives that Henry shall depose," would be doubtful, since, from the construction, it is uncertain whether Henry is to depose the duke, or the duke, Henry.

(13) *The fallacy of composition.* This fallacy occurs when the middle term is used distributively in the major premise and collectively in the minor, as in the following example:

Three and four are two numbers.
Seven is three and four.
∴ Seven is two numbers.

(14) *The fallacy of division.* This fallacy occurs when the middle term is used collectively in the major premise and distributively in the minor, as the following:

Seven is one number.
Three and four are seven.
∴ Three and four are one number.

(15) *The fallacy of accent or emphasis.* This fallacy consists in misplacing the accent or emphasis. In the proposition, "The study of Logic is not supposed to communicate a knowledge of many useful facts," place the emphasis first on *supposed*, then on *many*, then on *useful*, and state the sense expressed in each case.

(16) *The fallacy of figure of speech.* Thus, the following will illustrate:

A hero is a lion.
A lion is a quadruped.
∴ A hero is a quadruped.

Designing persons are untrustworthy.
Every body forms designs.
∴ Every body is untrustworthy.

**2. Rules guarding against fallacy.** — These are,

1st. Every syllogism must have three, and only three, terms — the major term, the minor term, and the middle term, and these terms must not be ambiguous.

2d. Every syllogism must have three, and only three, propositions — the major premise, the minor premise, and the conclusion, and these propositions must not be ambiguous.

3d. The middle term must be distributed at least in one of the premises.

4th. A term must not be distributed in the conclusion, unless it is distributed in one of the premises.

5th. If both premises are affirmative, the conclusion is affirmative.

6th. If one premise is affirmative and the other negative the conclusion is negative.

7th. If both premises are negative there is no conclusion.

8th. If the conclusion is universal, both premises are universal.

9th. If one premise is universal and the other particular, the conclusion is particular.

10th. If both premises are particular, there is no conclusion.

**3. General laws of the syllogism.** — These laws, on the

supposition that no formal fallacy is involved, are the following:

1st. The truth of the premises involves the truth of the conclusion; for the premises necessitate the conclusion.

2d. The falsity of the conclusion involves the falsity of one of the premises; for if the premises were true, the conclusion would be true.

3d. The falsity of a premise does not necessitate the falsity of the conclusion.

4th. The truth of the conclusion does not involve the truth of the premises.

The third and fourth laws are thus illustrated:

Every month has thirty days
April is a month.
∴ April has thirty days.

**4. Miscellaneous examples of fallacies.** — Characterize the following fallacies, stating the irregular examples in due form:

1. All good fathers provide food and clothing for their children. Mr. *B* provides food and clothing for his children. Therefore, Mr. *B* is a good father.

2. All moral beings are accountable. No brute is a moral being. Therefore, no brute is accountable.

3. No Pagan is a Christian. Every villager is a Pagan. Therefore, no villager is a Christian.

4. Nothing is better than wisdom. Dry bread is better than nothing. Therefore, dry bread is better than wisdom.

5. His imbecility of character might have been inferred from his proneness to favoritism; for all weak princes have this failing.

6. The express trains do not stop at this station. The

train that has just passed did not stop at this station. Therefore, the train that just passed is an express train.

7. A successful author must be very industrious or very talented. Gibbon was a successful author and was very industrious. Therefore, Gibbon was not very talented.

8. Who is most hungry eats most. Who eats least is most hungry. Therefore, who eats least eats most.

9. The end of a thing is its perfection. Death is the end of life. Therefore, death is the perfection of life.

10. He who believes himself to be always in the right in his opinions lays claim to infallibility. You always believe yourself to be right in your opinion. Therefore, you lay claim to infallibility.

11. Improbable events happen every day. But what happens every day is probable. Therefore, improbable events are probable.

12. The ancient Greeks produced the greatest masterpieces of eloquence and philosophy. The Lacedemonians were ancient Greeks. Therefore, the Lacedemonians produced the greatest masterpieces of eloquence and philosophy.

## CHAPTER XVIII.

### DEDUCTIVE REASONING.

**A material fallacy** is a fallacy in the matter of thought. It is said to be a fallacy *in re*, and is, therefore, *extra dictionem*, and, in fact, *extra logical*, unless it is also faulty in form.

Material fallacies can be detected only by those acquainted with the subject-matter, or with the special science under consideration. Thus, to settle matters of fact pertaining to plants, we appeal to botany; facts pertaining to the stars, fall within the province of astronomy, and so on.

Though material fallacies can not be detected purely by the methods of logic, yet it is important to point them out and classify them, thus rendering the mind alert, and diminishing the liabilities of falling into error.

We shall consider eight varieties of *material fallacies:*

**1. Assumptions.** — An assumption is that which is taken to be true without evidence. It may be true or false; but, resting on no basis of evidence, it is, in either case, invalid, not because known to be false, but because not known to be true. To assume an assumption false on account of its lack of evidence, is a procedure as invalid as to assume it true. There are several varieties of assumptions:

1st. *The want of attention* results in *non-observation* or *mal-observation.* Failing to notice many things, we are likely to assume their non-existence. Other things, not wholly overlooked, are, from inattention, misapprehended,

and assuming them to be what they are not, we are involved in confusion.

2d. *Prejudice* is a fruitful source of assumptions. Nor is it easy to divest ourselves of its influence, though we are loath to admit that we are, in any degree, subject to its control. Prejudice which leads to assumptions vitiating our judgments and involving us in error, may arise from too high an opinion of ourselves, or from too low an opinion of others; from ruling desires; from national, party, church, or society relations; from preconceived opinions, association, ignorance, or defective education. A generous disposition, a love of truth, due caution, and patient investigation, are guards against the assumptions arising from prejudice.

3d. *Superstition* has, especially in the past, been fruitful in assumptions; consider the mythologies, oracles, omens, witchcrafts, apparitions, ghosts, fairies, signs, and charms. Nor has superstition yet lost its influence, as is indicated by such current sayings as these: "If it rain the first Sunday of the month, it will rain every Sunday." "If you first see the new moon over your right shoulder, you will have good luck for that month." "If you have floating tea-leaves in your cup, you will have visitors."

4th. *Hasty generalization* leads to assumptions and involves us in error. We thus assume that what is true of ourselves is true of others; that what is true of a few individuals of a class is true of the class; that education is not desirable, because a few have risen to eminence without it; that fortune favors fools, because a man confessedly below par has accidentally become rich.

5th. *A want of thorough investigation* may lead to the assumption that a given appearance corresponds to the reality; that a temporary order of sequence is a law; that an accidental antecedent is a cause, or that an accidental consequent is an effect.

**2. The fallacy of accident.** — This fallacy consists in extending a rule to a case to which it is rendered inapplicable by some specific or accidental circumstance. There are three varieties.

1st. *Arguing from the general to the special.* Thus, every man has the right to inculcate his own opinions. A magistrate is a man. Therefore, a magistrate is justified in employing his official powers in forwarding his political or sectarian views. A magistrate has the same general rights as other men, and he may properly employ his powers as a man, but not as a magistrate, in propagating his opinions.

2d. *In arguing from the special to the general.* Thus, thieves are dishonest; but thieves are men; therefore all men are dishonest.

3d. *In arguing from one special case to another.* Thus, certain beggars do not deserve assistance; therefore, other beggars do not deserve assistance.

**3. Irrelevant conclusion.** — This fallacy, technically called *ignoratio elenchi*, consists in arguing to the wrong point, or proving one thing when another should be proved. This fallacy is the great resource of those who have a weak case, or the wrong side of the question. A certain English statesman, instead of proving the *expediency* of taxing the colonies, which was the real question to be considered, undertook to prove the *right*.

A form of this fallacy, called *argumentum ad hominem*, consists in arguing the case, not on its merits, but in relation to the opinion or character of your opponent, as when it is attempted to refute an opponent by proving that his present position is inconsistent with his previously expressed views or with his character.

Another form of this fallacy, called *argumentum ad populum*, consists in appealing to the prejudice or passions of the people. It is the weapon of demagogues.

There is still another form of this fallacy called *argumentum ad verecundiam*. It is an appeal to reverence for respected authority or venerable institutions.

Closely connected with the irrelevant conclusion, which logically follows from the premises, though it is not the conclusion in question, is an *unwarranted* conclusion from premises which warrant another conclusion. Thus, it is often inferred that the conclusion is false because the premises are false or the reasoning is illogical. The true inference is, that the conclusion is not proved; but it may be true, notwithstanding the premises are false. An able debater once said, "I have undertaken to prove the conclusion false, by showing the premises on which it is based to be unsound."

**4. The begging of the question,** *petitio principii*, called also *a circle in reasoning*, *circulus in probando*, consists in taking for one of the premises something which depends on the conclusion, and then having deduced the conclusion, employ it in proving the premise. Thus, it is reasoning in a circle, to assume that a party is right, and hence conclude that you ought to support it, and then attempt to justify the assumption that the party is right because you ought to support it.

The fallacy of reasoning in a circle may be unjustly charged. Thus, if your opponent sees that your proposition will lead to your conclusion, he may attempt to evade the force of your argument, by charging you with begging the question, and then escape in the cloud of dust which he raises.

**5. The fallacy of the consequent.** — This is the name of an argument so loose that no one can discover its cogency. It has no cogency. It is usually characterized by the expression, *non sequiter*, that is to say, it does not follow.

**6. The fallacy of false cause,** or *non causa pro causa*.

This fallacy consists in calling one thing the cause of another, because it is an antecedent, or one thing the effect of another, because it is a consequent. The fallacy of mistaking a consequent for an effect is described by the phrase, *post hoc, ergo propter hoc.*

7. **The fallacy of many questions.** — This fallacy consists in combining two or three questions in one, so that whether answered in the affirmative or negative, the answer can be turned to your disadvantage. Thus, if the question, "Have you left off beating your mother?" is answered in the affirmative, then the retort is that you formerly beat her; if in the negative, that you still beat her.

8. **The fallacy of objections.** — This fallacy consists in inferring a conclusion to be false, because objections can be raised against it. Very few things could be regarded proved, if only those are proved against which no possible objection can be raised. It is, perhaps, true that objections can be raised against any thing whatever. But this does not prove that nothing is true; for objections can be raised against either of two contradictory propositions, one of which must be true. If, however, a proposition conflicts with a known truth, it can not be true, and we have a warrant for its rejection.

**Miscellaneous examples of fallacies.** — Detect the fallacy in each of the following examples:

1. If Christianity were from God, it would be universal. It is not universal. Therefore, it is not from God.

2. You are not what I am. I am a man. Therefore, you are not a man.

3. He who calls you a man, speaks the truth. He who calls you a knave, calls you a man. Therefore, he who calls you a knave, speaks the truth.

4. You do not know what I am going to ask you about. I am going to ask you about the nature of

yourself. Therefore, you do not know about the nature of yourself.

5. The following sophism, called the *Achilles*, was proposed by Zeno, the Eleatic, and is very celebrated: If Achilles runs ten times as fast as a tortoise one mile ahead, he will never overtake it; for when Achilles has run this mile, the tortoise has run $\frac{1}{10}$ of a mile farther; when *Achilles* has run this $\frac{1}{10}$, the tortoise has advanced $\frac{1}{100}$ of a mile still farther, and so on, *ad infinitum*.

6. According to Zeno, a finite body is impossible. For if there be such a body, and if it be divided into any number of parts, the sum of the parts ought to be equal to the body. Let the number of parts be infinite. Then these parts either have magnitude, or they have no magnitude; if the parts have magnitude, their sum has infinite magnitude, since there is an infinite number of parts; if the parts have no magnitude, their sum will have no magnitude, since the sum of any number of zeros is zero. In neither case is the sum equal to the body, as it ought to be, since the sum of all the parts is equal to the whole. Hence, the supposition that there is a finite body, which led to this absurdity, is false.

7. The *Diodorus Cronus*, so called from its inventor, attempts to prove the impossibility of motion, thus: If motion is possible, a body moves either in the place where it is, or in the place where it is not. But it can not move in the place where it is, since it fills that place, leaving no room. It can not move in the place where it is not, for it is not there. Hence, it can not move at all, or motion is impossible.

8. The *Litigiosus*, or *Reciprocus*, is the notorious dilemma concerning a matter of business between Protagoras, the prince of Sophists, and Euathlus, his student in the law. Euathlus had contracted to pay his tuition fee when he gained his first case. But not being in a

hurry to commence the practice of law, Protagoras sued him for his fee, and thus addressed him in court: "Learn, most foolish of young men, that whatever be the decision of the judges, pay me my demand you must. For, if the judgment be against you, I shall obtain the fee by decree of the court; but if the judgment be in your favor, I shall obtain my fee by the terms of our contract, since you will then have gained your first case."

To this Euathlus replied, "Learn, most sapient of masters, from your own argument, that, whatever may be the decision of the court, absolved I must be from the payment of the fee. For, if the decision be in my favor, I shall pay nothing according to the decree of the court; but if the decision be against me, I pay nothing by virtue of the contract, since I shall not have gained my first case."

9. The *mentiens*, or sophism of the *liar*, was invented by Eubulides, and runs thus: "If you say that you lie, and tell the truth, then you do lie; but if you tell a lie, then you speak the truth. Hence, if you tell the truth you lie, and if you lie, you speak the truth."

10. If an event is to be, it will be, and effort is useless. If it is not to be, it will not be, and effort is useless. But it is evident that the event either is to be, or is not to be. Therefore, effort is useless.

11. According to Empedocles, the subject which knows and the object which is known must be of like nature; but the mind knows matter. Therefore, the mind and matter must be of like nature. Hence, the mind is resolvable into matter, or matter into mind.

12. According to M. Comte, the events of the world are not controlled by supernatural will; for if so, they would be both variable and beyond human control; but they are not variable, since they are the objects of hu-

man prevision in astronomy; neither are they beyond human control, since they are subject to human modification, as in physics.

13. Whatever I know, must be as I know, otherwise I could not know. I know that you are here. Therefore, you must be here, and hence are not a free agent.

14. Whatever God foreknows must be as He foreknows, otherwise he could not foreknow. God foreknows the actions of men. Therefore, these actions must be as God foreknows. Hence, these actions are necessitated, and men are not free agents.

15. If God is both able and willing to prevent sin, it would not occur; but sin does occur. Therefore, God is able to prevent it, but not willing; or willing, but not able; or neither willing nor able. If He is able, but not willing, He is not holy; if He is willing, but not able, He is not omnipotent; if He is neither willing nor able, He is neither holy nor omnipotent; but any of these consequences is subversive of the idea of God; hence, there is no God.

It may be remarked that fallacy, in general, may be summarily divided into fallacy of apprehension, fallacy of reasoning, and fallacy of assumption.

Fallacy of apprehension consists in misapprehension in regard either to the proposition itself or to its grounds. Its essence is confusion.

Fallacy of reasoning consists in illogical inference, and is either formal or material.

Fallacy of assumption consists in taking the premises for granted without evidence. Probable premises, however, may be employed, if the conclusion also be regarded as only probable.

## CHAPTER XIX.

### DEDUCTIVE REASONING.

**1. A knowledge** of the doctrine of *Mood* and *Figure*, as developed in this and the following chapter, though not essential in testing a sound argument or in detecting a fallacy, as the preceding discussions prove, is nevertheless interesting in itself and in its historical associations.

**2. The mood** of syllogism is the designation of the quantity and quality of its propositions, taken in the order of major premise, minor premise, and conclusion, each by one of the symbols, *A*, *E*, *I*, *O*.

Thus, the mood of the following syllogism is *E A E*.

No *M* is *P*.
All *S* is *M*.
∴ No *S* is *P*.

**3. The number** of possible moods is thus determined: Any one of the four propositions, *A*, *E*, *I*, *O*, may be the major premise, each having either *A*, *E*, *I*, *O*, for the minor premise, making sixteen combinations of premises, each combination having either *A*, *E*, *I*, *O*, for the conclusion, making sixty-four possible moods. These sixty-four moods are therefore divided into four groups having *A*, *E*, *I*, *O*, respectively, for the major premise; each group is divided into four sub-groups, having *A*, *E*, *I*, *O*, respectively, for the minor premise; and each sub-group is divided into four moods, having *A*, *E*, *I*, *O*, respectively, for the conclusion, as thus exhibited:

| | Group A. | Group E. | Group I. | Group O. |
|---|---|---|---|---|
| *Sub-group A* | *A A A* | *E A A* | *I A A* | *O A A* |
| | *A A E* | *E A E* | *I A E* | *O A E* |
| | *A A I* | *E A I* | *I A I* | *O A I* |
| | *A A O* | *E A O* | *I A O* | *O A O* |
| *Sub-group E* | *A E A* | *E E A* | *I E A* | *O E A* |
| | *A E E* | *E E E* | *I E E* | *O E E* |
| | *A E I* | *E E I* | *I E I* | *O E I* |
| | *A E O* | *E E O* | *I E O* | *O E O* |
| *Sub-group I* | *A I A* | *E I A* | *I I A* | *O I A* |
| | *A I E* | *E I E* | *I I E* | *O I E* |
| | *A I I* | *E I I* | *I I I* | *O I I* |
| | *A I O* | *E I O* | *I I O* | *O I O* |
| *Sub-group O* | *A O A* | *E O A* | *I O A* | *O O A* |
| | *A O E* | *E O E* | *I O E* | *O O E* |
| | *A O I* | *E O I* | *I O I* | *O O I* |
| | *A O O* | *E O O* | *I O O* | *O O O* |

**4. Valid** moods are those in which valid arguments can be constructed. *Invalid* moods are those in which valid arguments can not be constructed.

Most of the above moods are invalid, since they violate one or more of the following rules:

(1) If both premises are affirmative, the conclusion is affirmative.

(2) If one premise is affirmative and the other negative, the conclusion is negative.

(3) If both premises are negative, there is no conclusion.

(4) If the conclusion is universal, both premises must be universal.

(5) If one premise is universal and the other particular, the conclusion is particular.

(6) If both premises are particular, there is no conclusion.

(7) The middle term must be distributed in, at least, one of the premises.

(8) No term must be distributed in the conclusion which is not distributed in one of the premises.

**5. The negative** method of finding the valid moods is as follows:

Point out the invalid moods, and tell which of the above rules are violated. The moods not violating any of the above rules are valid. Tell which moods are valid. Remember that a mood is valid, if a valid argument can be constructed in it, though other arguments in the same mood be invalid.

The above method of determining the valid moods may be characterized as the *negative method*, since the valid moods are not positively determined, but are those left, after striking out the moods that are invalid.

The following moods are valid: *A A A*, *A A I*, *A E E*, *A E O*, *A I I*, *A O O*, *E A E*, *E A O*, *E I O*, *I A I*, *O A O*. The mood *I E O* involves an illicit process of the major term. Prove this.

**6. The positive** method of determining the valid moods is as follows:

1st. *If the conclusion is A, both premises must be A.* For since the conclusion is universal, both premises must be universal, and hence both *A*, or both *E*, or one *A* and the other *E*. Both premises can not be *E*, for then, by rule (3), there would be no conclusion. One premise can not be *A* and the other *E*, for then, by rule (2), the conclusion would be negative. Hence, if the conclusion is warranted at all, both premises must be *A*, which is the only remaining case.

That *A A A* is a valid mood, is verified by the following valid syllogism:

All *M* is *P*.
All *S* is *M*.
∴ All *S* is *P*.

2d. *If the conclusion is E, one premise must be A, and the other E.* Prove this and construct valid syllogisms having the moods, *A E E, E A E*, respectively.

3d. *If the conclusion is I, both premises are affirmative, and one, at least, universal.* Prove this and construct valid syllogisms having the moods, *A A I, A I I, I A I*, respectively.

4th. *If the conclusion is O, one premise must be affirmative*, the other negative, and one, at least, universal. Prove this, and construct valid syllogisms whose moods are, *A E O, E A O, A O O, O A O, E I O*, respectively.

## CHAPTER XX.

### DEDUCTIVE REASONING.

**The figure** of a syllogism is the position of its middle term with respect to the extremes in the premises.

Let *M* denote the middle term, *P* the major, and *S* the minor, and let the order of the letters denote the order of the terms. Then we have the following figures:

| | 1st. Fig. | 2d. Fig. | 3d. Fig. | 4th. Fig. |
|---|---|---|---|---|
| Major premise, | *M P* | *P M* | *M P* | *P M* |
| Minor premise, | *S M* | *S M* | *M S* | *M S* |
| Conclusion, | *S P* | *S P* | *S P* | *S P* |

In the first figure, the middle term is the subject of the major premise and the predicate of the minor.

In the second figure, the middle term is the predicate of both premises.

In the third figure, the middle term is the subject of both premises.

In the fourth figure, the middle term is the predicate of the major premise and the subject of the minor.

Remember that a universal proposition, *A* or *E*, distributes its subject; that a negative, *E* or *O*, distributes its predicate; that a particular, *I* or *O*, does not distribute its subject; that an affirmative, *A* or *I*, does not, in general, distribute its predicate; also, that the middle term must be distributed, at least, in one of the premises; and that a term must not be distributed in the conclusion, if it is not distributed in one of the premises, since that would be an illicit process.

FIGURE I.

1st. *Order of terms.* The *order* of the terms is $\begin{cases} M\ P. \\ S\ M. \\ S\ P. \end{cases}$

2d. *Definition.* Figure first is that figure in which the middle term is the subject of the major premise and the predicate of the minor.

3d. *Valid moods.* The valid moods of Fig. I. are thus determined:

(1) To have an *affirmative* conclusion, both premises must be affirmative. The major premise must be universal, otherwise the middle term would not be distributed, since it is not distributed as the predicate of the affirmative minor premise. If the minor premise is universal, the conclusion may be universal or particular; but if the minor premise is particular, the conclusion is particular. Hence, *A A A*, *A A I*, *A I I*, are valid affirmative moods in Fig. I. The mood *A A I* is usually discarded, since the premises warrant the conclusion *A*, which implies *I*.

(2) To have a *negative* conclusion, the major premise must be negative, in order to distribute the predicate which is distributed in the conclusion. The minor premise must be affirmative, otherwise both premises would be negative, and there would be no conclusion. The major premise must be universal, in order to distribute the middle term, which is not distributed as the predicate of the affirmative minor premise. If the minor premise is universal, the conclusion may be universal or particular; but if the minor premise is particular, the conclusion must be particular. Hence, *E A E*, *E A O*, *E I O*, are valid negative moods in Fig. I. The mood *E A O* is usually discarded, since the premises warrant the conclusion *E*, which implies *O*.

4th. *Doctrine.* The doctrine of Fig. I. is the following:

(1) The middle term is the subject of the major premise, and the predicate of the minor.

(2) The major premise is universal, and the minor affirmative.

(3) The conclusion agrees in quality with the major premise, and in quantity with the minor.

(4) All forms of conclusion, *A*, *E*, *I*, *O*, are admissible in Fig. I.

5th. *Aristotle's dictum.* Whatever is predicated, affirmatively or negatively, of any term distributed, may be predicated, in like manner, of whatever is contained under that term. This *dictum* is sometimes separated into two *dicta:*—the *dictum de omni*, Whatever is affirmed of any term distributed, may be affirmed of any thing contained under that term; and the *dictum de nullo*, Whatever is denied of any term distributed, may be denied of any thing contained under that term.

6th. *Names.* The names of the arguments in Fig. I. are *b A r b A r A*, *c E l A r E n t*, *d A r I I*, and *f E r I O*. The vowels denote the propositions. Construct these arguments, using the letters, *M*, *P*, *S*, and test their validity by circles, also by Aristotle's dictum. Illustrate by concrete arguments. See *Schuyler's Logic*, pp. 65, 78.

FIGURE II.

1st. *Order of terms.* The *order* of terms is $\begin{cases} P\ M. \\ S\ M. \\ S\ P. \end{cases}$

2d. *Definition.* Figure second is that figure in which the middle term is the predicate of both premises.

3d. *Valid moods.* The valid moods of Fig. II. are thus determined:

In order to distribute the middle term, since it is the predicate of both premises, one of the premises must be

negative; hence the other premise must be affirmative, otherwise there would be two negative premises, and therefore no conclusion. Since one premise is affirmative and the other negative, the conclusion is negative, and therefore its predicate is distributed; hence, the major premise must be universal in order to distribute its subject, which is distributed as the predicate of the conclusion. If the minor premise is universal, the conclusion may be universal or particular; but, if the minor premise is particular, the conclusion is particular. Hence, *E A E*, *A E E*, *E A O*, *A E O*, *E I O*, *A O O*, are valid moods in Fig. II. The moods, *E A O*, *A E O*, are usually discarded, since the premises warrant the conclusion *E*, which implies *O*. The striking fact in this figure is that the conclusion is always negative.

4th. *Doctrine.* The doctrine of Fig. I. is the following:

(1) The middle term is the predicate of both premises.

(2) One premise is affirmative and the other is negative.

(3) The major premise is universal.

(4) The conclusion is negative, and agrees in quantity with the minor premise.

5th. *Names.* The names of the arguments in Fig. II. are *c E s A r E*, *c A m E s t r E s*, *f E s t I n O*, *f A k O r O*.

Construct the arguments and test them by circles, and illustrate by concrete examples. Aristotle's dictum does not directly apply to any of the four figures except the first. Syllogisms in Figures II., III., or IV. can always be reduced to those in Fig. I., and then tested by the dictum, and thus it is shown that all categorical syllogisms conform to one principle, a fact of great scientific interest. The consonants in the names of the syllogisms furnish the key to the reduction, as shown hereafter.

FIGURE III.

1st. *Order of terms.* The *order* of the terms is $\begin{cases} M & P. \\ M & S. \\ S & P. \end{cases}$

2d. *Definition.* Figure third is that figure in which the middle term is the subject of both premises.

3d. *Valid moods.* The valid moods of Fig. III. are thus determined:

In order to distribute the middle term, one of the premises must be universal. This is also true of any syllogism, in any figure. The conclusion can not be universal, either affirmative or negative. For:

(1) The conclusion can not be a universal affirmative; for then both premises must be universal affirmative, and there would be an illicit process of the minor term, since it would be distributed in the conclusion, as subject of a universal, but undistributed in the minor premise, as the predicate of an affirmative.

(2) The conclusion can not be a universal negative; for then both premises must be universal, one affirmative, and the other negative; if the major premise is affirmative, there would be an illicit process of the major term, since it would be distributed in the conclusion as predicate of a negative, but not distributed in the major premise as predicate of an affirmative; if the minor premise is affirmative, there would be an illicit process of the minor term, since it would be distributed in the conclusion, as the subject of a universal, but not in the minor premise, as predicate of an affirmative.

Since the conclusion can be neither a universal affirmative nor a universal negative, it is particular, which is the striking fact in this figure.

If the conclusion is affirmative, both premises must be

affirmative. If the conclusion is negative, the major premise must be negative, in order to distribute its predicate, the major term, which is distributed as the predicate of the negative conclusion; and, therefore, the minor premise must be affirmative. Hence, *A A I*, *I A I*, *A I I*, *E A O*, *O A O*, *E I O*, are valid moods in Fig. III.

4th. *Doctrine.* The doctrine of Fig. III. is the following:

(1) The middle term is the subject of both premises.

(2) One premise is universal, and the minor is affirmative.

(3) The conclusion is particular and agrees in quality with the major premise.

5th. *Names.* The names of the arguments in Fig. III. are, *d A r A p t I*, *d I s A m I s*, *d A t I s I*, *f E l A p t O n*, *d O k A m O*, *f E r I s O*. Construct the arguments and test them by circles; also illustrate by concrete examples.

FIGURE IV.

1st. *Order of terms.* The *order* of terms is $\begin{cases} P\ M. \\ M\ S. \\ S\ P. \end{cases}$

2d. *Definition.* Figure fourth is that figure in which the middle term is the predicate of the major premise and the subject of the minor.

3d. *Valid moods.* The valid moods in Fig. IV. are thus determined:

(1) If the conclusion is *affirmative*, both premises must be affirmative, the minor premise universal, in order to distribute the middle term which is not distributed as the predicate of the affirmative major premise, the major premise may be universal or particular, and the conclusion must be particular, otherwise there would be an illicit process of the minor term, which is not distributed as the predicate of the affirmative minor premise.

Hence, the valid affirmative moods in Fig. IV. are *A A I*, *I A I*.

(2) If the conclusion is *negative*, one premise must be affirmative and the other negative, and the major premise must be universal in order to distribute its subject, which is distributed as the predicate of the negative conclusion; and if the major premise is affirmative, the minor must be negative, since the conclusion is negative, and universal, in order to distribute the middle term, which is not distributed as the predicate of the affirmative minor premise, and the conclusion may be universal or particular; but if the major premise is negative, the minor must be affirmative, either universal or particular, and the conclusion must be particular, otherwise there would be an illicit process of the minor term.

Hence, *A E E*, *A E O*, *E A O*, *E I O*, are valid negative moods in Fig. IV. The mood *A E O* is usually discarded, since the premises warrant *E*, which implies *O*.

4th. *Doctrine.* The doctrine of Fig. IV. is the following:

(1) The middle term is the predicate of the major premise and the subject of the minor.

(2) Either the major premise must be negative or the minor universal.

(3) If the conclusion is affirmative, both premises must be affirmative, the minor universal, the major universal or particular, and the conclusion particular.

(4) If the conclusion is negative, the major premise must be universal, and if affirmative, the minor premise must be a universal negative, and the conclusion universal; but if the major premise is negative, the minor must be affirmative, either universal or particular, and the conclusion must be particular.

(5) All forms of conclusion, except *A*, are admissible in Figure IV.

5th. *Names.* The names of the arguments in Fig. IV.

are, *b r A m A n t Ip*, *c A m En Es*, *d Im A r Is*, *f Es Ap O*, *f r Es Is On*. Construct these arguments, test them by circles, and illustrate by concrete examples.

The fourth figure was not recognized by Aristotle, but is supposed to have been introduced by Galen.

It is an awkward figure, and the propriety of giving it a place among the figures is questioned by many logicians. See Mahan, pp. 121–4; Hamilton, pp. 285, 302, 626; Coppee, p. 117; Tappan, p. 347; Thompson, pp. 201–6; Wilson, p. 110; Whateley, p. 96; Davis, 156–8.

**5. Comparative view of the four figures.**

1st. In the first figure, the middle term is the subject of the major premise and predicate of the minor; the major premise is universal, and the minor affirmative; the conclusion agrees in quality with the major premise, and in quantity with the minor; every conclusion, *A*, *E*, *I*, *O*, is admissible in this figure, and *A* in no other; the *dictum* is directly applicable only to this figure, which, from this fact, as well as from its clearness, has been regarded by Aristotle and by other logicians, as the most perfect of all the figures.

2d. In the second figure, the middle term is the predicate of both premises; one premise is affirmative, and the other is negative; the major premise is universal; the conclusion is negative and agrees in quantity with the minor premise; this figure is naturally used in disproving a statement.

3d. In the third figure, the middle term is the subject of both premises; one premise is universal, and the minor is affirmative; the conclusion is particular, and agrees in quality with the major premise; this figure is naturally used when the middle term is singular, and in establishing objections, by proving exceptions to general statements.

4th. In the fourth figure, the middle term is the predi-

cate of the major premise and subject of the minor; either the major premise must be negative or the minor universal; if the conclusion is affirmative, both premises must be affirmative, the minor universal the major universal or particular, and the conclusion particular; if the conclusion is negative, the major premise must be universal, and if affirmative, the minor premise must be a universal negative, and the conclusion universal; but if the major premise is negative, the minor must be affirmative, either universal or particular, and the conclusion must be particular; all the conclusions except *A* are proved in this figure.

According to Lambert, "The first figure is suited to the discovery or proof of the properties of a thing; the second, to the discovery or proof of the distinctions between things; the third, to the discovery or proof of instances and exceptions; the fourth, to the discovery or exclusion of the different species of a genus."

**6. The unfigured syllogism.**—This demands notice.

1st. *Definition.* The *unfigured syllogism* is an argument in which the terms of the propositions do not sustain to each other the relation of subject and predicate.

2d. *Examples*

(1) Positive

*A* and *B* always co-exist.
*B* and *C* always co-exist.
∴ *A* and *C* always co-exist.

(2) Negative

*A* and *B* always co-exist.
*B* and *C* never co-exist.
∴ *A* and *C* never co-exist.

3d. *Laws.* The laws of the unfigured syllogism are the following:

(1) As far as two terms agree with a third term, so far they agree with each other.

(2) As far as one term agrees and another disagrees with a third, so far they disagree with each other.

4th. *Remark.* Some logicians have questioned the existence of the unfigured syllogism, claiming that such syllogisms can always be reduced to those in one or the other of the figures. But the question is not, Can the unfigured syllogism be made to assume a figure? but, Does it, as it stands, have a figure?

The following exercises will be useful:

1st. Reduce the foregoing examples of the unfigured syllogism to syllogisms in the first figure.

2d. Deduce the conclusion from the following premises, and state the figure, mood, and name of the argument:

(1) { All mammalia are vertebrates.
{ Some amphibious animals are mammalia.

(2) { No planets are self-luminous.
{ All planets are heavenly bodies.

(3) { No fish suckles its young.
{ The whale suckles its young.

(4) { Ruminants are not predacious.
{ The lion is predacious.

3d. Construct an argument having false premises and a true conclusion.

4th. Supply premises which prove the following conclusions, and state the figure, mood, and name of the syllogism:

(1) No vicious conduct is heroic.
(2) No wicked man is happy.
(3) Some worthy of admiration are not philosophers.
(4) Some who are admired are dreaded.

## CHAPTER XXI.

### DEDUCTIVE REASONING.

**Reduction** is the transformation of an argument in the second, third, or fourth figures into one of the first. There are two kinds of reduction — the direct and the indirect.

**1. Direct reduction.** — The direct reduction of the so called imperfect figures to the perfect, that is, the second, third, and fourth to the first, is readily accomplished by the subjoined method, than which, as Hamilton has remarked, "There are few human inventions which display a higher ingenuity."

First, thoroughly learn the following lines, which may be scanned as Latin Hexameters:

*BArbArA, cElArEnt, dArII, fErIOque prioris; CEsArE, cAmEstrEs, fEstInO, fAKOrO, secundæ; Tertia, dArAptI, dIsAmIs, dAtIsI, fElAptOn, DOkAmO, fErIsOn, habet; quarta insuper addit BrAmAntIp, cAmEnEs, dImArIs, fEsApO, frEsIsOn.*

The *initial consonants* denote reduction to syllogisms in the first figure, beginning with the same letters. Thus, initial *b* denotes reduction to *bArbArA; c*, to *cElArEnt; d*, to *dArII; f*, to *fErIO.* These consonants do not aid in making the reductions, but are a check on the result.

The other consonants, so far as expressive, have the following significations: *m* denotes that the premises are

to be transposed; *s* that the proposition represented by the preceding vowel is to be converted simply; *p*, that the proposition represented by the preceding vowel is to be converted by limitation, that is, its quantity is changed from universal to particular, except in *brAm-Ant Ip*, in which the quantity is changed from particular to universal; *k*, that the preceding *A* is to be changed to *E*, or *O* to *I*, and the result converted simply.

The following are given as specimen reductions:

$$cEsArE \begin{cases} \text{No } P \text{ is } M. \\ \text{All } S \text{ is } M. \\ \therefore \text{No } S \text{ is } P. \end{cases} = cElArEnt \begin{cases} \text{No } M \text{ is } P. \\ \text{All } S \text{ is } M. \\ \therefore \text{No } S \text{ is } P. \end{cases}$$

$$fAkOrO \begin{cases} \text{All } P \text{ is } M. \\ \text{Some } S \text{ is not } M. \\ \therefore \text{Some } S \text{ is not } P. \end{cases} = fErIO \begin{cases} \text{No } non\text{-}M \text{ is } P. \\ \text{Some } S \text{ is } non\text{-}M. \\ \therefore \text{Some } S \text{ is not } P. \end{cases}$$

The *A* of the major premise, All *P* is *M*, is changed to *E*, No *P* is *non-M*, as denoted by *k*, which converted simply, gives No *non-M* is *P*. If the minor premise *O* remain negative, no conclusion could be drawn, since we should have two negative premises; moreover, the middle term would not be the same in form in the two premises, giving the ambiguous middle; but if we change *O*, Some *S* is not *M*, to *I*, Some *S* is *non-M*, these difficulties will both be obviated, as seen above.

Reduce all the syllogisms of the second, third, and fourth figures to those in the first.

**2. Indirect reduction.** — This is accomplished, not by the use of the consonants, but by the following *rule:*

*Substitute the contradictory of the conclusion for the major premise, except in the second figure and in cAmEnEs of the fourth, in which substitute for the minor.*

One example will serve to illustrate the method:

$$cEsArE \left\{ \begin{array}{l} \text{No } P \text{ is } M. \\ \text{All } S \text{ is } M. \\ \therefore \text{No } S \text{ is } P. \end{array} \right\} \text{gives} \left\{ \begin{array}{l} \text{No } P \text{ is } M. \\ \text{Some } S \text{ is } P. \\ \therefore \text{Some } S \text{ is not } M. \end{array} \right\} fErIO$$

But Some $S$ is not $M$ is the contradictory of All $S$ is $M$, which is true by hypothesis; therefore, Some $S$ is not $M$ is false; hence, either No $P$ is $M$ or Some $S$ is $P$ is false; but No $P$ is $M$ is true by hypothesis; therefore, Some $S$ is $P$ is false; but Some $S$ is $P$ is the contradictory of No $S$ is $P$, which is, therefore, true. Observe that, in the new syllogism, $P$ is the middle term.

The truth of the original conclusion is thus established by reasoning in connection with a new argument in the first figure. In some cases, the new conclusion is the contrary instead of the contradictory of the rejected premise; but it is false in either case. The falsity of the new conclusion involves the falsity of one of the premises; but one of these premises is a premise in the original syllogism, and is, therefore, true by hypothesis; hence, the other premise, which is always the *contradictory* of the original conclusion, is false, and since false, its contradictory, or the original conclusion, is true.

By *indirect reduction*, reduce all the syllogisms of the second, third, and fourth figures to those of the first, and vindicate the original conclusions.

Construct concrete arguments, as the following, in the second, third, or fourth figures, and reduce them by both methods.

No science is capable of perfection.
All science is worthy of cultivation.
∴ Something worthy of cultivation is not capable of perfection.

## CHAPTER XXII.

### INDUCTIVE REASONING.

**Induction** is the process of inferring general propositions from particular instances. It includes, therefore, both the discovery of the particular instances, and the inference of the general proposition.

Induction may be classified as follows:

Induction { Mathematical — demonstrative. / Logical { Perfect — demonstrative. / Imperfect — probable.

**Mathematical induction** is the process of proving a general proposition by means of an empirical fact together with a conditional principle. The empirical fact is that the proposition holds true for several of the first of the consecutive cases; and the conditional principle is that if the proposition holds for any case, it holds for the next. The nature of mathematical induction will be made clear by the following illustrations:

1. **In the series of odd numbers,** 1, 3, 5, 7, . . ., *find any term, and the sum of the terms.*

To find *any term*, observe that, for the first term, $1 = 1 \times 2 - 1$; for the second term, $3 = 2 \times 2 - 1$; for the third term, $5 = 3 \times 2 - 1$; for the fourth term, $7 = 4 \times 2 - 1$; that is, so far as examined, any term is twice the number of the term, minus 1, which is the empirical fact required.

To prove by mathematical induction that the law is

general, it is necessary to prove the conditional principle that if the law hold true for any number of terms, it holds for the next term. Assuming the law true for $n$ terms, we have $1, 3, 5, 7, \ldots 2n-1$.

Since two added to any odd number gives the next greater odd number, we have, by adding 2, the next term,

$$2n-1+2=2n+1=2(n+1)-1.$$

But $2(n+1)-1$ is twice the number of the term, minus 1; hence, if the law hold for any number of terms, it holds for the next term; but the law does hold, as shown above, up to the 4th term; hence, by the above principle, it holds for the 5th term; and since for the 5th, then for the 6th, and so on up to the $n$th, that is, for any number of terms.

To find the *sum of the terms*, observe that for one term, $1=1^2$; for two terms, $1+3=4=2^2$; for three terms, $1+3+5=9=3^2$; for four terms, $1+3+5+7=16=4^2$; and so on, that is, so far as examined, the sum of the terms is equal to the square of the number of the terms, which is the empirical fact required.

To prove the law general, it is necessary to prove the conditional principle, that if it hold for any number of terms, it holds for one term more. Assuming it true for $n$ terms, we have

$$1+3+5+7+\ldots+2n-1=n^2.$$

Adding the next term to both members, we have

$$1+3+5+7+\ldots+2n-1+2n+1=n^2+2n+1=(n+1)^2.$$

Hence, if the law hold for $n$ terms, it holds for $n+1$ terms; that is, since $n$ may be any number, if it hold

for any number of terms, it holds for one term more, which is the conditional principle required; but the law holds, as shown above, up to the 4th term; hence, by the above principle, it holds for five terms; and since for five, then for six, and so on for any number of terms. Hence, the law is general.

**2. The difference of the same powers of two quantities is divisible by the difference of the quantities.**

By actual division, we shall find that

$$(a-b) \div (a-b) = 1; \quad (a^2-b^2) \div (a-b) = a+b;$$
$$(a^3-b^3) \div (a-b) = a^2 + a\,b + b^2.$$

This gives the required empirical fact.

If we should go on, in this way, to the 100th power, and find no exceptions, it would not prove the law general, though it would render it highly probable. This is the method of probable induction; and giving only probable conclusions, it is tolerated only when no better methods are attainable.

To prove the law general, it is necessary to prove that if it hold for any power, it holds for the next higher power.

To show this, let us divide $a^{n+1}-b^{n+1}$ by $a-b$.

$$\begin{array}{l|l} a^{n+1}-b^{n+1} & a-b \\ \underline{a^{n+1}-a^n b} & \overline{a^n = \text{quotient}} \\ \text{Remainder} = a^n b - b^{n+1} = b(a^n - b^n). & \end{array}$$

Now, it is evident that if $a^n-b^n$, which is a factor of the remainder, is divisible by $a-b$, the whole remainder, and consequently the dividend, $a^{n+1}-b^{n+1}$, is divisible by $a-b$; that is, if the difference of any powers, of the same degree, of two quantities is divisible by the difference of the quantities, then the difference of

the powers one degree greater is divisible by the difference of the quantities, which is the conditional principle.

But it has already been found, by trial, that the difference of the powers of the same degree, up to the 3d power, is divisible by the difference of the quantities; hence, by the above principle, the difference of the 4th powers is divisible by the difference of the quantities; and since the difference of the 4th powers, then the difference of the 5th powers, and so on to any degree. Hence, the law is general.

**3. To find the law of bodies falling in a vacuum, on the supposition that gravity near the earth is a constant force.**

Let $g$ be the velocity generated by gravity in one second. Since the body, by its inertia, retains all the velocity it has acquired, and gravity is a constant force, it receives each second an increment $g$ of velocity; hence, the velocity generated varies with the time, and at the expiration of the successive seconds, 1, 2, 3, 4, 5, ..., is

$$g,\ 2g,\ 3g,\ 4g,\ 5g,\ \ldots$$

The body starts from rest, and is uniformly accelerated, since gravity is constant; hence, the velocity at the expiration of the first second, which is $g$, is twice the average velocity for the second; therefore, the space described the first second is $\frac{1}{2}g$. The space described in any second is equal to the space which it would have described without gravity, which is equal to the velocity at the expiration of the preceding second, plus $\frac{1}{2}g$, the space due to gravity for one second. Hence, the spaces described in the successive seconds are,

$$\frac{1}{2}g,\ \frac{3}{2}g,\ \frac{5}{2}g,\ \frac{7}{2}g,\ \frac{9}{2}g,\ \cdots$$

The whole space described in any number of seconds

is evidently obtained by taking the sum of the corresponding number of terms of the last series, and hence is

$$\tfrac{1}{2}g,\ \tfrac{4}{2}g,\ \tfrac{9}{2}g,\ \tfrac{16}{2}g,\ \tfrac{25}{2}g,\ \ldots$$

By examining these series, we observe that the velocity at the expiration of any second is equal to $g$ multiplied by the number of the second; that the space described in each of the successive seconds is equal to $\frac{1}{2}g$ multiplied by one less than twice the number of the second; that the whole space is equal to the space described in the first second multiplied by the square of the number of seconds. These are the empirical facts.

To *generalize* the laws, it will be necessary to show that if they hold for $t$ seconds, they hold for $t+1$ seconds. Assuming them true for $t$ seconds, we have,

$$(1)\ g,\ 2g,\ 3g,\ 4g,\ \ldots \qquad tg.$$

$$(2)\ \tfrac{1}{2}g,\ \tfrac{3}{2}g,\ \tfrac{5}{2}g,\ \tfrac{7}{2}g,\ \ldots\ \frac{2t-1}{2}g.$$

$$(3)\ \tfrac{1}{2}g,\ \tfrac{4}{2}g,\ \tfrac{9}{2}g,\ \tfrac{16}{2}g,\ \ldots\ \frac{t^2}{2}g.$$

The velocity for the $(t+1)^{st}$ second is evidently $(t+1)g$; the space described in the $(t+1)^{st}$ second is $tg+\frac{1}{2}g$, which is equal to $\dfrac{2t+1}{2}g=\dfrac{2(t+1)-1}{2}g$; the whole space, which is found as before, is

$$\frac{t^2}{2}g+\frac{2t+1}{2}g=\frac{t^2+2t+1}{2}g=\frac{(t+1)^2}{2}g.$$

Hence, if the laws hold for $t$ seconds, they hold for $t+1$ seconds; that is, since $t$ may be any number of

seconds, if they hold for any number of seconds, they hold for one second more, which is the conditional principle; but the laws hold, as shown above, up to five seconds; and since for five, then for six, and so on, for any number of seconds up to $t$. Hence, the laws are general.

Denoting the velocity by $v$, the space described in the $t^{th}$ second by $s'$, and the whole space by $s$, we have

$$v = g \times t;\ s' = \tfrac{1}{2} g \times (2t - 1);\ s = \tfrac{1}{2} g \times t^2.$$

From the foregoing illustrations of Mathematical induction, it is evident that the empirical fact that the law holds for several of the first consecutive cases, which is found by trial, gives, by itself, only a probable conclusion, as in probable induction; that the conditional principle, gives, by itself, only the conclusion that if the law hold for any case, it holds for the next case; and that the empirical fact and the conditional principle, taken together, give an induction of the utmost generality, whose truth is demonstrably certain.

## CHAPTER XXIII.

### INDUCTIVE REASONING.

**The subsidiaries** of induction are experience, observation, experiment, hypothesis, analogy, classification, and denomination.

**1. Experience** is the accumulated knowledge of the past, and is either personal, that is, our own experience; or foreign, that is, the experience of others, obtained from testimony.

**2. Observation** is the direction of the attention to the facts of matter or mind. It takes the form of perception, when the facts are external, or physical, and the form of consciousness, when the facts are internal, or psychical.

**3. Experiment** is the act of placing the facts in circumstances favorable for observation, by means of instruments or apparatus by which we vary the conditions of the phenomena.

In pure observation, we *find* our instances; but in experiment, we *make* them. By experiment we vary the circumstances or degree of the phenomenon under consideration, or isolate it, or combine it with other phenomena, and thus greatly extend our field of observation. Trial is a simple experiment. It may be made with little apparatus, or with none at all.

In some cases, experiment is impracticable, as in astronomy, where the facts are acquired by observation, though the observation may be aided by such instruments as the telescope. In other cases, experiment is

indispensable, as in chemistry, where experiment is the chief resource. In most sciences, both observation and experiment are requisite.

To make an observation or to perform an experiment properly, the mind should be in a vigorous condition, and free from prepossession, partiality, or prejudice; and the attention should be withdrawn from all irrelevant objects, and concentrated upon the object to be examined, which should be divided, if necessary, till the perceptions become clear and distinct.

**4. An hypothesis** is a supposition made to account for the co-existence or succession of phenomena.

The *tendency* of the human mind to frame hypotheses is very strong. The explanation of this tendency is found in the intuition of causality — that every event must have a cause. It should be remembered, however, that this intuition does not inform us what the cause is, but only that there must be a cause. Room is thus left for hypothesis; and since the hypothesis may be true or false, it should, therefore, be regarded as merely provisional, till verified or refuted by further investigation.

The *utility* of hypotheses is evident from the following considerations:

1st. An hypothesis, though unverifiable, may be useful in affording a probable explanation of phenomena otherwise inexplicable. The hypothesis of an attenuated medium called *ether* pervading space, accounting for the transmission of light from the stars, is an example of an hypothesis of this kind.

2d. An hypothesis may be useful in affording an explanation, which, though conjectural, may afterwards be verified. Kepler discovered the laws of planetary revolution by making various hypotheses, some of which he afterwards verified.

3d. An hypothesis, though it prove false, may be use-

ful in leading to another which may be verified. Kepler made no less than nineteen different hypotheses of planetary motion before he discovered the truth.

4th. An hypothesis may be useful in colligating and distinguishing the phenomena to be explained, thus directing the course of investigation, and preventing a waste of time and labor.

The *formation* of hypotheses is due largely to the imagination; but as the inventions of this fertile faculty are not all worthy of the highest confidence, it is important to guard against a hasty acceptance of a plausible hypothesis.

The *characteristics* of hypotheses worthy of consideration are the following:

1st. An hypothesis should be probably or at least possibly true.

2d. An hypothesis should, if possible, be of such a nature as to admit of verification or refutation, or at least of being rendered, by subsequent investigation, more or less probable.

3d. An hypothesis should be capable of accounting for all the phenomena, without exception.

The hypothesis which possesses these characteristics may be accepted, provisionally, as true, subject, of course, to subsequent verification or refutation. The hypothesis which affords, at the same time, an explanation of different classes of facts, has a very high probability of truth.

The only possible hypothesis which can account for the phenomena must be accepted as the true explanation. Such an hypothesis has the force of an intuition.

The following example will serve as an illustration of an hypothesis considered verified: To account for the deflection of the path of a planet from a straight line, Newton assumed a force directed towards the center of the sun. He then showed that the action of such a force

on a planet, in connection with its projectile force, is the only force which could cause the radius vector of the planet to describe equal areas in equal times—a fact already known as one of Kepler's laws; hence, the hypothesis of a force directed towards the sun is regarded as established. It does not follow, however, that the sun exerts this force, that is, attracts or draws the planet towards himself. The force may possibly be due to currents of ether running in towards the sun.

Newton also assumed that the deflecting force varies inversely as the square of its distance from the sun, and proved that this is the only supposition which would account for Kepler's second and third laws—facts already known; hence this hypothesis is also to be regarded as verified. It is remarkable that this would be the law, if the deflecting force is due to currents of ether setting in towards the sun.

**5. Analogy** is the likeness of relations, or the resemblance of two things, from which we infer that an additional fact known of one is probably true of the other.

The conditions to be complied with in reasoning from analogy are the following:

1st. The objects compared must agree in certain respects.

2d. The attributes observed should be positive and essential, and not negative and accidental.

The conclusion is only probable; but this probability is increased in proportion to the number of congruent attributes; to the importance of the congruent attributes; to the number and accuracy of the observations.

The following is an example of analogical reasoning:

*A* has the attributes *p*, *q*, *r*, and *s*.
*L* has the attributes *p*, *q*, *r*.
∴ *L* probably has the attribute *s*.

This argument can be refuted, if it can be shown:

1st. That *s* is the effect of some cause found in *A* but not in *L*.

2d. That there are present with *A* and absent from *L*, certain circumstances which are indispensable to *s*.

3d. That *L* has attributes incompatible with *s*.

4th. That the circumstances attending *L* prevent the existence of *s*.

As a concrete illustration of an argument from analogy, and a counter argument, take the following:

The earth is an opaque solid, nearly spherical, derives its light and heat from the sun, and is inhabited.

The moon is an opaque solid, nearly spherical, derives its light and heat from the sun. Therefore, the moon is probably inhabited.

If the points of agreement are equally likely to be the conditions of life, the probability that the moon is inhabited would vary directly as the number of such points of agreement.

The points of difference, that the moon is only a secondary, that it is smaller and more rugged, that it revolves on its axis but once in twenty-eight days, that it has no atmosphere and no water, present a counter probability that it is not inhabited; and this counter probability is strengthened, when we reflect that some of the circumstances wanting on the moon, such as air and water, are indispensable conditions of life on the earth; we must, therefore, conclude either that the moon is not inhabited at all or that the conditions on which life depends on the moon are totally different from the conditions on which life depends on the earth. The conditions of life on the moon being, therefore, different from those on the earth, if they exist at all, the more points of resemblance established between the moon and the earth, the indispensable conditions of life which exist

on the earth being wanting in the moon, the less the probability of the supposed different conditions, and consequently, the less the probability that the moon is inhabited.

Analogical arguments, if not refuted, may be usefully employed in showing the reasonableness of the conclusion; in removing prejudice; in silencing objections; in preparing the mind for direct argument.

**6. Classification and denomination** are also subsidiary to induction; but these have been sufficiently treated in chapters II–V. of this division.

The *distinction* between knowledge and belief may be profitably considered in this connection.

*Knowledge* implies that a truth be correctly expressed by a proposition; that this proposition be clearly apprehended; that the truth of the proposition, if primitive, be known by intuition, either empirical or rational; that the truth of the proposition, if derivative, be based on grounds whose truth is known by intuition or is logically derived from other grounds ultimately known by intuition.

*Belief* implies a proposition based on probability; and this probability may vary between the limits, known actuality and known impossibility, without ever reaching either limit; for if it reach either limit, the belief is transformed into knowledge, either of the truth or of the falsity of the proposition.

## CHAPTER XXIV.

### INDUCTIVE REASONING.

**Logical induction** is the process of discovering that a certain thing is true of parts of a class, and thence inferring that the same thing is true of the whole class.

Mathematical induction generalizes its common fact, or proves it to be a law by showing that if it hold for any instance, it holds for the next; but logical induction passes from the parts to the whole, without the intervention of a conditional principle.

Logical induction is divided into two varieties — perfect, or demonstrative, when all the instances are examined; and imperfect, or probable, when only a part of the instances are examined.

**1. Perfect induction** is the process of establishing a general proposition by an examination of all the particular instances. By discovering that a certain thing is true of all the parts, we prove that the same thing is true of the whole. The following are examples:

By examination, we find that $A$ has the property $P$, that $B$ has $P$, that $C$ has $P$, and that $D$ has $P$; but $A$, $B$, $C$, and $D$ constitute the class $E$; therefore, all of the class $E$ have the property $P$.

In geometry, a proposition involving several cases is proved to be true for each case, and hence to be universally true. The reasoning in each case may be deductive; but the method of establishing the general proposition by establishing its truth in each case, is essentially inductive.

Some logicians assert that what is called perfect induction is not induction at all, since, after finding that a certain thing is true of every case, nothing remains but to sum up and state, in one general proposition, what is already known. But the process in question conforms to the definition of induction, since, from the discovery of what is true of the parts, it establishes what is true of the whole. Whether we examine all the instances or only a part of them, is not essential to induction itself, though it affords the discriminating characteristic by which we divide induction into perfect and imperfect. Perfect induction is the limiting case of imperfect induction. The same general formula which expresses the degree of probability of the conclusion in imperfect induction, expresses, as will be shown hereafter, the certainty of the conclusion in perfect induction, thus showing, beyond question, that the two are species of the same genus

In perfect induction, the finding that a certain fact is true in the particular instances, does not warrant the certainty of the general conclusion, that it is true in all the instances, unless it is also known that the instances in which the fact is found true are all the instances.

The minor premise does not assert that the fact is true of all the instances; for then it would be identical with the conclusion; but that the instances examined are all the instances. The argument is not stated thus:

*A* has the property *P*, so has *B*, and *C*, and *D*.
All of the individuals of the class *E* have *P*.
∴ All of the individuals of the class *E* have *P*.

This would be trifling; but the statement is thus:

*A* has the property *P*, so has *B* and *C* and *D*.
But *A*, *B*, *C*, *D* are the whole of the class *E*.
∴ All of the class *E* have *P*.

Perfect induction is applicable to those cases in which the instances are few in number and accessible.

**2. Imperfect induction** is the process of inferring the probability of a general proposition from an examination of some of the particular instances. The following is an example:

By examination, we find that *A* has the property *P*, so has *B*, and *C*, and *D*. . . . . But *A*, *B*, *C*, *D*, are some individuals of the class *E*; therefore, all of the class *E* probably have the property *P*.

This conclusion is logical so long as it is stated to be only probable; but it would be illogical if it were stated as certain.

The following examples will serve to illustrate the difference between perfect and imperfect induction, the first being perfect, the second imperfect:

Mercury, Venus, the Earth, Mars, etc., all move round the sun from west to east; but Mercury, Venus, the Earth, Mars, etc., are all the known planets; therefore, all the known planets move round the sun from west to east.

Mercury, Venus, the Earth, Mars, etc., all move round the sun from west to east; but Mercury, Venus, the Earth, Mars, etc., are all the known planets; therefore, all the planets probably move round the sun from west to east.

Whether the induction be perfect or imperfect, there must be no exceptions in the cases examined.

No doubt that in perfect induction, before all the cases are examined, the mind jumps to the conclusion, or infers the general proposition by an imperfect induction,

and then by a perfect induction verifies its conclusion. In an imperfect induction, the conclusion remains unverified.

A *comparison* of Probable induction and Analogy leads to the following results:

1st. By probable induction we infer that if many objects of a class have a common quality, all the objects of that class probably have that quality; that is, an attribute known to be present in a part of the extent of a class is inferred as probably present in the whole extent of that class.

2d. By analogy we infer that two objects agreeing in certain respects, probably agree in other respects; that is, an attribute known to be a part of the content of one of two objects whose contents agree in many common qualities, is inferred as probably a part of the content of the other object.

3d. Probable induction and analogy agree in the fact that they give only probable conclusions, and that the degree of the probability may vary between the limits, impossibility and certainty, without ever reaching either limit.

4th. There is, however, a most intimate relation between induction and analogy, which we now proceed to point out. Reasoning by induction is essentially the same as reasoning from analogy, but with this modification—that in simple analogy, we reason from one of the objects of a class to another object of that class, whereas in induction, we reason from several objects of a class to the remaining objects of the class, thus increasing the probability of the inference, by increasing the extent of the evidence, and diminishing the probability of the inference, by increasing the extent of the conclusion.

Let $A$ and $L$ be two objects of a class, each known

to have the qualities, $p$, $q$, $r$, and let $A$ also be known to have the quality $s$, then we infer that $L$ probably has the quality $s$. This is reasoning from analogy. The argument is not, that because we have found $s$ combined with $p$, $q$, $r$, in many objects of the class, we shall, therefore, find $s$ combined with $p$, $q$, $r$, in $L$; but that because we have found that $A$ and $L$ agree in possessing so many qualities, $p$, $q$, $r$, in common, we may likewise find any quality, $s$, which is in $A$, also in $L$. The argument is based on the number of qualities common to the two objects, $A$ and $L$, and not on the number of objects having the common qualities.

Now, if another object $B$, of the same class, has the same qualities, $p$, $q$, $r$, how would the probability that $L$ has $s$ be affected, if it is also found that $B$ has $s$? The probability of the inference that $L$ has $s$ would evidently be strengthened by finding that $B$ has $s$. Here we begin to pass from analogy to induction, not on the side of the conclusion, but on that of the evidence, by increasing its extent.

The probability that $L$ has $s$ is likewise strengthened every time we find in the class an object, $C$, $D$, $E$, ... having not only the qualities, $p$, $q$, $r$, but also $s$.

So far we have strengthened analogy, increasing the probability of the inference by increasing the extent of the evidence, and the process becomes inductive with respect to the evidence, but not with respect to the conclusion.

Let there be, in the same class, another object $M$, having the qualities, $p$, $q$, $r$, and differing from $L$ in no essential circumstance. The probability that $M$ has $s$ is evidently equal to the probability that $L$ has $s$; hence, we can infer with the same probability that any other object, $N$, $O$, $P$, ... not differing essentially from $L$, and having the qualities, $p$, $q$, $r$, and belonging to that class,

has the quality *s*. We still have, so long as we restrict the conclusion to one of the objects, *L*, *M*, *O*, *P*, ... only a strengthened analogy, inductive as to the evidence, but not with respect to the conclusion.

Now, if we infer that all the remaining objects, *L*, *M*, *N*, *O*, *P*, ... known to have *p*, *q*, *r*, and belonging to that class, have the quality *s*, we reason by induction, both with respect to the evidence and the conclusion. But is the probability of the inference the same as before, or is it strengthened or weakened? In other words, how does the probability that all the remaining objects, *L*, *M*, *N*, ... of the class have the quality *s*, compare with the probability that any one of them, as *L*, has this quality? The probability that all have *s* is evidently less than that any one of them has *s;* for, since there is a chance of failure in each instance, there is greater probability that there will be failure when all the instances are considered than when only one is considered.

To estimate this probability, it is necessary to discuss briefly the *doctrine of chances*, including simple and compound probability.

Thus, if there be a vase, containing *m* white and *n* black balls, what will be the probability of drawing a white ball?

There are $m+n$ chances of which *m* are favorable; hence, the probability of drawing a white ball is $\frac{m}{m+n}$. Hence the measure of a simple probability is equal to the number of favorable chances divided by the whole number of chances. Since $m < m+n, \frac{m}{m+n} < 1$; hence, a simple probability is less than 1.

If in another vase, there are *t* red and *u* blue balls,

the probability of drawing a red ball is $\frac{t}{t+u}$. If $u=0$, the probability of drawing a red ball becomes $\frac{t}{t}=1$, the symbol of certainty.

Now, if a ball be drawn from each vase, what is the probability that we shall have a white and a red ball?

Combining the balls in the two vases, in sets of two, any one of the $m+n$ balls can be combined with any one of $t+u$ balls, giving $(m+n)(t+u)=mt+mu+nt+nu$ possible chances, of which $mt$ are favorable; hence, by the law of simple probability, the probability of drawing a white and a red ball is $\frac{mt}{mt+mu+nt+nu}=\frac{m}{m+n}\times\frac{t}{t+u}=$ the product of the simple probabilities. Hence, the compound probability of the joint occurrence of two chances is the product of their simple probabilities. In like manner, it can be shown that the probability of the joint occurrence of any number of chances is the product of their simple probabilities.

To return from this digression, let the probability that $L$ has $s$ be denoted by $\frac{x}{y}$, then $\frac{x}{y}$ will also express the probability, that any one of the objects, $M$, $N$, $O$, ... has $s$.

Let $n$ denote the number of the objects, $L, M, N, \ldots$ Then since the compound probability that all of these objects, $L$, $M$, $N$, ... have $s$ is the product of the simple probabilities that they severally have $s$, we have for the compound probability that all have $s$,

$$\frac{x}{y}\times\frac{x}{y}\times\frac{x}{y}\cdots=\left(\frac{x}{y}\right)^n, \text{ which is less than } \frac{x}{y}, \text{ since } \frac{x}{y}<1.$$

Since $A$, $B$, $C$, $D$ ... up to $L$ are known to have $s$, the

probability that all the objects of the class have $s$ is also $\left(\frac{x}{y}\right)^n$. This probability increases as the number of objects of the class known to have $s$, increases, that is, as $n$ diminishes; it becomes certainty when $n=0$; but then the induction becomes perfect, since the objects known to have $s$ are all the objects of the class.

The increase of probability as $n$ diminishes, is due to two causes — the extent of evidence is increased, and the extent of inference is diminished. The formula $\left(\frac{x}{y}\right)^n$ exhibits the law, since as more and more of the objects of the class are found to have $s$, $\frac{x}{y}$ increases and approaches 1, and $n$ diminishes and approaches 0, and both these changes conspire to increase $\left(\frac{x}{y}\right)^n$. When all the objects are found to have $s$, $\frac{x}{y}=1$, the symbol of certainty, and $n=0$, and we shall have $1^0=1$, or the induction is perfect.

Since the expression, $\left(\frac{x}{y}\right)^n$, which denotes the probability of the conclusion in imperfect induction, gives the certainty of the conclusion in perfect induction, the two cases are connected by the same law; hence, perfect induction, so far from not being induction at all, as some logicians assert, is the limiting case of imperfect induction; in other words, perfect induction and imperfect induction are the two species of the genus logical induction.

## CHAPTER XXV.

### INDUCTIVE REASONING.

**From** the *fundamental* agreement of induction and analogy, it follows that the *ground* of induction will be found, if we find the ground of analogy.

According to the law of association, $p, q, r$, in $L$ would suggest $s$, since $s$ is found in connection with $p, q, r$, in $A$; but this is merely the occasion of the suggestion, and not the ground of the inference.

The ground of the induction is not found by throwing the induction into a syllogism, as Whately does, as thus exhibited:

Whatever belongs to the individuals examined belongs to the whole class under which they come.
$s$ belongs to the individuals examined.
$\therefore s$ belongs to the whole class.

Observe that in the major premise the predication is made of every quality found in the individuals examined, and not simply of the one quality $s$. The major premise having, therefore, a wider subject than the conclusion, a subject including that of the conclusion, is less probable, since it is more probable that any one quality $s$ found in connection with $p, q, r$, in $A$, will also be found in connection with $p, q, r$, in $L$, than that *every* quality found in connection with $p, q, r$, in $A$ will also be found in connection with $p, q, r$, in $L$. The wider induction of the major premise being less probable than the narrower induction of the conclusion, is more diffi-

cult to establish, and can not, therefore, be taken for the proof of the conclusion, which is more evident than the major premise itself. If, however, the major premise can be rendered probable in any degree by evidence, independent of the conclusion, it will follow that the conclusion will be probable in a still higher degree.

But how is this major premise obtained, resolvable as it seems to be into the uniformity of the laws of nature? Whately replies, "Whether the belief in the constancy of Nature's laws,—a belief of which no one can divest himself—be intuitive, and a part of the constitution of the human mind, as some eminent metaphysicians hold, or acquired, and in what way acquired, is a question foreign to our purpose." It is evident that Whately throws no light on the ground of induction.

Mill says, "Whatever be the most proper mode of expressing it, the proposition, that the course of nature is uniform, is the fundamental principle or general axiom of induction. It would yet be a great error to offer this large generalization as any explanation of the inductive process. On the contrary, I hold it to be itself an instance of induction, and induction by no means of the most obvious kind. Far from being the first induction we make, it is one of the last, or at all events, one of those which are latest in attaining philosophical accuracy. . . . . Yet this principle, though so far from being our earliest induction, must be considered as our warrant for all the others in this sense, that unless it were true all other inductions would be fallacious."

If the induction, that the course of nature is uniform, is the latest induction, and is the warrant of all the others, then these others are made without warrant, and this so-called fundamental induction is itself without warrant. We have here the fallacy of the vicious circle. Through the first inductions, made without warrant, we

work up to the final induction, that the course of nature is uniform, and then take this generalization from unwarranted inductions, as the warrant of those unwarranted inductions of which it is the generalization.

Experience, including observation and experiment, in furnishing the facts of analogy, has much to do with induction. We have thus often found that, in couples of objects having common qualities, an additional quality found in one, is afterwards found in the other. An expectancy is thus awakened in other cases. The finding of the objects $A$ and $L$, having the common qualities, $p$, $q$, $r$, is due to experience; also the knowledge of the fact that $A$ has $s$; then by analogy we infer that $L$ probably has $s$. The strengthened analogy arising from finding in the class containing $A$ and $L$, other objects $B$, $C$, $D$, ... each having, not only $p$, $q$, $r$, but also $s$, is likewise due to experience.

Other reasons than experience, however, seem to enter into the ground of the induction, since, for the same extent of experience, the induction is much more highly probable in some cases than in others. In certain cases, a single instance warrants an induction, with so high a degree of probability as to approach certainty; while in other cases, many instances are scarcely sufficient to warrant any induction at all, even of a low degree of probability.

If $s$ is an accident in $A$, produced by circumstances not attending $L$, and not by causes inherent in $A$, or if the causes which produce $s$ are inherent in $A$, but not in $L$, or if $L$ has some attribute inconsistent with $s$, or if the circumstances attending $L$ tend to prevent $s$, the probability that $L$ has $s$ is greatly diminished, if not reduced to zero.

The common ground of analogy and induction is found in the two following principles:

(1) Every constant coincidence of phenomena has its cause and its conditions.

(2) Like conditions and causes are followed by like consequences.

The reason of the coincidence of the first principle is that one phenomenon is the cause of the other, or that they have a common cause or some causal relation.

The reason of the second principle is found in the fact that the two cases are essentially alike, and whatever determines the effect in the one case, is present to determine it in the other.

These two principles, which are rational intuitions, furnish the warrant for the induction that nature is uniform in her operations, the essential antecedents being, by supposition, the same in the cases compared.

From the above principles, it follows that in the case considered, the probability that $L$ has $s$ varies with the probability that the conditions and causes connected with $L$ are essentially the same as those connected with $A$. If this can be known with certainty, the conclusion that $L$ has $s$ will also be certain; and if it is also certain that the same essential conditions and causes hold for each of the remaining instances, $M, N, \ldots$ of the class, it will be equally certain that any one of these instances, $M, N, \ldots$ has $s$; that is, the expression for the strength of the conclusion for each instance, which is denoted by $\frac{x}{y}$ becomes 1, the symbol for certainty; hence, it is certain that all of the instances, $L, M, N, \ldots$ have $s$, since the probability in this case is $1 \times 1 \times 1 \times 1 \ldots = 1^{\infty} = 1 =$ certainty.

To illustrate the above, take the case of the mathematician who in proving the proposition, *The square of the hypotenuse of a right triangle is equivalent to the sum of the squares of the other sides*, draws a particular right

triangle and constructs a square on each of the three sides; and assuming the constructions perfect, proves by deductive reasoning that the square of the hypotenuse is equivalent to the sum of the squares of the other sides. He then concludes that the same is true for every right triangle of which there is an infinite number, varying in the relative proportion of their sides, and also in their magnitude, from those too small to be seen with the naked eye, to those whose sides are millions of miles in extent. Here we seem to infer the widest possible induction from a single instance; but the reason which determines the consequent is the same in every instance. The proof does not turn on the relative length of the sides, nor on their magnitude, but solely on the fact that the triangle is right angled, and hence holds true for any triangle which conforms to this hypothesis, and, therefore, for all such triangles. Hence, the strength of the general conclusion is $1^{\infty} = 1 =$ certainty. The truth of the proposition, for the figure drawn, is not determined experimentally, as that would be impossible exactly to do; but it is determined deductively; and since like reasons hold for every like case, the proposition is true for every particular case, and hence for all cases, and is, therefore, universally true.

We are now able to see how mathematical reasoning is characterized by demonstrative certainty — its facts are definite, and its processes strictly logical; it keeps the essential facts clearly in view, and disregards those that are not essential. Since the essential antecedent conditions are the same in each of the infinity of possible instances, and the conclusion is demonstrated for one, it is certain for any other, and hence is true for all.

Pascal has remarked, that "Geometry is almost the only subject as to which we find truths wherein all men agree; and one cause of this is, that geometers alone

regard the true laws of demonstration." These are the following:

"1st. To define nothing which can not be expressed in clearer terms than those in which it is already expressed.

"2d. To leave no obscure or equivocal terms undefined.

"3d. To employ in the definition, no terms not already known.

"4th. To omit nothing in the principles from which we argue, unless we are sure it is granted.

"5th. To lay down no axiom which is not perfectly self-evident.

"6th. To demonstrate nothing which is already as clear as it can be made.

"7th. To prove every thing in the least doubtful by means of self-evident axioms, or of propositions already demonstrated.

"8th. To substitute mentally the definition instead of the thing defined."

These principles are of especial application in deduction; but they have their bearing upon induction, since deduction is often employed in establishing the particular instances which are used in inferring the general proposition of induction.

In cases not mathematical, the probability of the general proposition approaches certainty in proportion as the antecedents in the cases compared approach essential identity. This explains why, in certain cases, as in chemistry, a very few experiments warrant an induction of very high probability, if not certainty, whereas, in other cases, as in natural history, many observations give to the induction but a moderate degree of probability. Thus, it was thought to be a well established induction, that all swans are white; but black swans were afterwards found in Australia.

Since, in the inductions of nature, we can never be absolutely certain from observation that the conditions and causes are essentially alike, the induction can never be absolutely certain, but at best can possess only a high degree of probability.

The methods of conducting experimental inquiry have been elaborately discussed by Mr. Mill under the designation of the Method of Agreement, the Method of Difference, the Joint Method of Agreement and Difference, the Method of Residues, and the Method of Concomitant Variations.

The reader is referred to *Mill's Logic*, Chapter VIII., and to *Fowler's Inductive Logic*, Chapter III. See also *Jevon's Logic*, Lessons XXVII. to XXXI.

## CHAPTER XXVI.

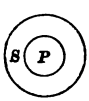
### MODERN LOGIC.

**1. Hamilton,** by the quantification of the predicate, made eight propositions, four of which are ambiguous:

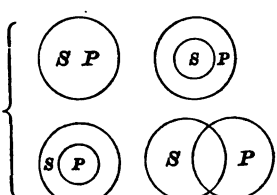
(*U*) All *S* is all *P*.


(*A*) All *S* is some *P*.


(*Y*) Some *S* is all *P*.

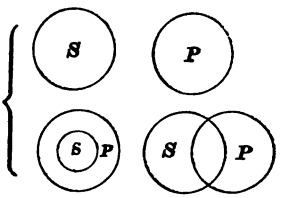



(*I*) Some *S* is some *P*.

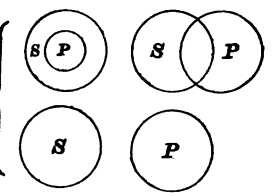



(*E*) Any *S* is not any *P*.

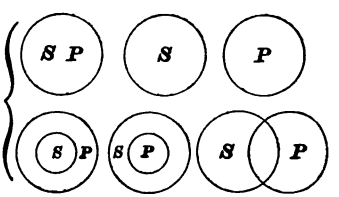
($\eta$) Any $S$ is not some $P$.




($O$) Some $S$ is not any $P$.




($\omega$) Some $S$ is not some $P$.




In Hamilton's scheme, both ($A$) and ($Y$) express the relation of subordination. In ($A$), the subordinate concept is the subject, but in ($Y$), the subordinate concept is the predicate; but since we can, if we choose, always take the subordinate concept for the subject, we shall, in the following scheme, treat ($A$) and ($Y$) as one.

**2. Definite deduction.**— In definite deduction the propositions are all definite, each expressing but one relation between the subject and the predicate.

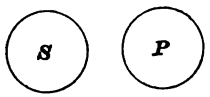
There are only four possible relations between two terms in extensive quantity — co-extension, exclusion, subordination, and intersection. Definite propositions are obtained by expressing these relations.

Let the initial letters, ($C$), ($E$), ($S$), ($I$), respectively,

express the relations of co-extension, exclusion, subordination, and intersection. Then we have the following definite propositions:

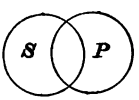
(*C*) *S* is co-extensive with *P*.


(*E*) *S* is excluded from *P*.




(*S*) *S* is subordinate to *P*.

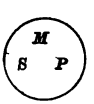

(*I*) *S* intersects *P*.




The *laws* warranting the conclusions, (*C*), (*E*), (*S*), (*I*), may be stated and exemplified thus:

1st. *The relation of co-extension is warranted in the conclusion, if each extreme is co-extensive with the middle term.*

Thus, { *P* is co-extensive with *M*.
*S* is co-extensive with *M*.
∴ *S* is co-extensive with *P*.

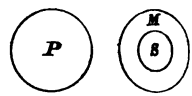



Let the argument be stated in the other figures.

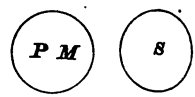
2d. *The relation of exclusion is warranted in the conclusion, if either extreme is either subordinate to, or co-extensive with, the middle, and the other extreme is excluded from the middle.*

(1) { *P* is subordinate to *M*.
*S* is excluded from *M*.
∴ *S* is excluded from *P*.

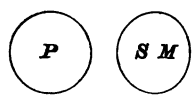
(2) $\begin{cases} P \text{ is excluded from } M. \\ S \text{ is subordinate to } M. \\ \therefore S \text{ is excluded from } P. \end{cases}$




(3) $\begin{cases} P \text{ is co-extensive with } M. \\ S \text{ is excluded from } M. \\ \therefore S \text{ is excluded from } P. \end{cases}$

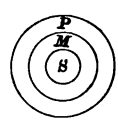



(4) $\begin{cases} P \text{ is excluded from } M. \\ S \text{ is co-extensive with } M. \\ \therefore S \text{ is excluded from } P. \end{cases}$



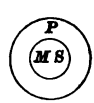

3d. *The relation of subordination is warranted in the conclusion, if the middle term is subordinate to the major, and the minor to the middle; or if the middle is co-extensive with the major, and the minor is subordinate to the middle; or if the middle is subordinate to the major, and the minor is co-extensive with the middle.*

(1) $\begin{cases} M \text{ is subordinate to } P. \\ S \text{ is subordinate to } M. \\ \therefore S \text{ is subordinate to } P. \end{cases}$



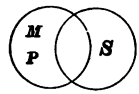

(2) $\begin{cases} M \text{ is co-extensive with } P. \\ S \text{ is subordinate to } M. \\ \therefore S \text{ is subordinate to } P. \end{cases}$


(3) $\begin{cases} M \text{ is subordinate to } P. \\ S \text{ is co-extensive with } M. \\ \therefore S \text{ is subordinate to } P. \end{cases}$

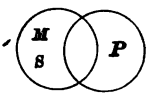



4th. *The relation of intersection is warranted in the conclusion, if the middle term is co-extensive with one extreme and intersects the other.*

(1) $\left\{\begin{array}{l} M \text{ is co-extensive with } P. \\ S \text{ intersects } M. \\ \therefore S \text{ intersects } P. \end{array}\right.$




(2) $\left\{\begin{array}{l} M \text{ intersects } P. \\ S \text{ is co-extensive with } M. \\ \therefore S \text{ intersects } P. \end{array}\right.$




Let us now *restate* the above syllogisms in the briefest possible manner, by using $(C)$ for *is co-extensive with*, $(E)$ for *is excluded from*, $(S)$ for *is subordinate to*, and $(I)$ for *intersects*. Then we have

$$\left.\begin{array}{l} P\ (C)\ M. \\ S\ (C)\ M. \\ \therefore S\ (C)\ P. \end{array}\right\} \text{Illustrate this and the following by circles.}$$

$$\begin{array}{llll} P\ (S)\ M. & P\ (E)\ M. & P\ (C)\ M. & P\ (E)\ M. \\ S\ (E)\ M. & S\ (S)\ M. & S\ (E)\ M. & S\ (C)\ M. \\ \therefore S\ (E)\ P. & \therefore S\ (E)\ P. & \therefore S\ (E)\ P. & \therefore S\ (E)\ P. \end{array}$$

$$\begin{array}{lll} M\ (S)\ P. & M\ (C)\ P. & M\ (S)\ P. \\ S\ (S)\ M. & S\ (S)\ M. & S\ (C)\ M. \\ \therefore S\ (S)\ P. & \therefore S\ (S)\ P. & \therefore S\ (S)\ P. \end{array}$$

$$\begin{array}{ll} M\ (C)\ P. & M\ (I)\ P. \\ S\ (I)\ M. & S\ (C)\ M. \\ \therefore S\ (I)\ P. & \therefore S\ (I)\ P. \end{array}$$

This method is remarkable for clearness, precision, and simplicity. The propositions are perfectly definite, each denoting but one relation.

$(A)$, $(I)$, $(O)$ in Aristotle's system, and $(I)$, $(\eta)$, $(O)$, $(\omega)$ in Hamilton's, are ambiguous, each being consistent with two or more relations.

The systems of *De Morgan*, *Boole*, and *Jevons* are worthy of attention. For a knowledge of these systems, we refer to the works of these authors.

# PART II.

## *FEELING AND THE SENSIBILITY.*

## CHAPTER I.

### PHYSICAL FEELINGS.

**Feelings** are agitations of the soul. They embrace all those phenomena of the soul not included in cognitions and volitions. In feeling, the soul is chiefly passive in the reception of an incitement, but is involuntarily active in its response.

The feelings may be roughly classified as physical, vital, and psychical.

The *physical feelings* are those especially related to the organism, as sensations, instincts, and appetites.

The *vital feelings* are those which are especially related to the vitality or health of the organism, as a sense of rest or fatigue, of vigor or languor, and of health or sickness.

The *psychical feelings* are those especially related to the soul, as emotions, affections, and desires.

The word *feeling*, as a generic term, includes all these phenomena, and is, therefore, the term needed; whereas, the word *emotion*, used by Dr. McCosh, is too specific, since it includes only a part.

The feelings imply the *sensibility* or susceptibility of feeling. Without the sensibility, as a faculty or susceptibility, feeling, as a phenomenon, would be impossible. The susceptibility of experiencing any specific feeling is called an *appetence*.

The feelings also imply *causes*, external or internal, physical or psychical, real or ideal, which excite them and call them forth as phenomena of consciousness.

Cognitions tend to excite feeling, and the wider the sweep of the cognitions, the wider the range of the objects concerning which feeling may arise; but there is no necessary ratio between the strength of the intellect and the intensity of feeling.

The feelings are also more or less intimately related to certain organic affections, either as causes or as effects.

We then have feelings as phenomena of consciousness, the appetencies implied by these feelings, the exciting causes, and the organic affections.

The *physical feelings* have been defined as those especially related to the organism, and classified as sensations, instincts, and appetites.

**1. Sensations** are those feelings which are occasioned by the excitement of some portion of the organism, caused, in normal cases, by the action of a stimulus.

Since sensation has already been discussed as the condition of perception, it will suffice, in this connection, to give a brief summary, and assign it to its place among the feelings.

The *conditions* of sensation are the *sensorium* consisting of the nervous system and sense organs, *excitants* or objects capable of exciting the sensorium, the *action* of excitants on the sensorium, and the *sensibility* or general susceptibility of feeling.

Sensations are, in general, *localized*, definitely or vaguely, that is, are referred to the part of the sensorium affected. In certain instances, the location of the sensation is quite definite, but in other instances it is only vaguely apprehended.

The *object* of consciousness in sensation is neither the sensorium excited, nor the external excitant, but the sensation itself as a state of the sensibility.

The *quality* of sensation involves existence as opposed to non-existence, and identity, or the fact that the sen-

sation is itself and nothing else, involving peculiarity, or the positive characteristics of the sensation, and particularity, or the negation of the positive characteristics of any other thing.

The *quantity* of a sensation involves its *degree of intensity*, varying between the limits zero and a degree so great as to be insupportable, its *temporal relations* of date and duration, and its *spatial relations* of locality, and, in some instances at least, but more vaguely, of extent and form.

*Complex* sensations only are capable of analysis, which may be effected, in some cases, by reflection alone, but in other cases, only by the aid of experiment.

Sensations are identified or discriminated as similar or dissimilar in *kind*, according as they are acquired through the same sense or through different senses.

Sensations are identified or discriminated as similar or dissimilar in *variety*, according as they involve similar or dissimilar qualities.

Sensations similar in kind may be similar or dissimilar in variety, but sensations dissimilar in kind are also dissimilar in variety.

Sensations similar in kind and variety may agree or differ in degree of intensity or in temporal or spatial relations, and, as such, may accordingly be identified or discriminated.

Sensations are classified as to kind, when referred to the organs or senses through which they are acquired. They are subdivided both as to quality and quantity.

Agreeable or pleasurable sensations are those which arise from normal excitement of the sensorium; and disagreeable or painful sensations are those which arise from abnormal excitement of the sensorium.

The *general sensations* comprise all those connected with the various portions of the organism, except the

five senses. They may be divided into the muscular, the nervous, the nutritive, the circulatory, and the respiratory.

The *special sensations* are those connected with the organs of the five senses,—smell, taste, touch, hearing, and sight.

**2. Instincts** are blind tendencies to actions, having for their ends the physical well-being of the individual or of the species.

The actions prompted by instinct are automatic in their impulses, though, in form, apparently intelligent and voluntary. They occupy the border territory between the purely automatic movements below, as the beating of the heart, and the rational activities above, as in reasoning.

The instincts have their basis and spring in the spontaneous movements of the living organism. By the evolutionist, they are regarded as habits—not as acquired habits, induced by the actions of the individual, but as hereditary habits, organized and embodied in the physical constitution, and manifested as reflex actions of a more or less complicated character. The truth probably is that they have their origin in the constitution of the species as formed by the Creator, modified by inherited habits formed through successive generations and organized in the physical constitution.

Though instincts are directed towards ends, there is no reason for supposing that these ends are clearly conceived or deliberately aimed at by the individual. The brute is, no doubt, blind to the end, though his actions are directed towards the end with as much precision as if it were clearly apprehended and deliberately pursued.

The end of instinctive actions is the physical well-being of the individual or of the race, designed and se-

cured by the Author of Nature, through the automatic action of the organism.

The instincts may be classed as follows:

1st. Those relating to subsistence, as in procuring, storing, and eating food.

2d. Those relating to the propagation of the species, as pairing, building nests, and the care of the young.

3d. Those of a more general nature, as hybernation and migration, excited by causes internal and external.

Instincts have the following characteristics:

1st. Through organic states, they blindly prompt to actions whose end is the physical well-being of the individual or of the species. That the actions prompted by instinct are blindly directed and not the result of reflective intelligence is illustrated by the fact that a hen will sit as readily on stones as on eggs; that she shows the same solicitude for the ducklings which she has hatched as for the chickens from her own eggs; and that when her ducklings take to the water, she manifests great alarm, yet her eyes are not opened to the fact that she is rearing the children of strangers. That instinctive actions are prompted by organic conditions is illustrated by the fact that a hen determined to sit may be cured of this propensity by dipping her breast several times in cold water.

2d. The instinctive actions are always performed by individuals of the same species in essentially the same way without the guide of experience or education. Thus, young mammalia are impelled to suck their mother's breasts; the young chick to pick up a grain of wheat at first sight; the young robin to open its mouth to receive the food which its mother brings.

3d. The instincts, in certain cases, at least, act periodically, corresponding to the wants of the individuals or their offspring. Thus, the old birds care for their

young till they are fully fledged, and then leave them to care for themselves.

4th. The instincts are not rigidly fixed but are, within certain limits, plastic, varying with the physical structure of the individuals, and accommodating themselves, to a certain extent, to the modifications of external circumstances, thus enabling the individual to adapt itself to its environment. Thus, a hen will sit more than three weeks to hatch the eggs of turkeys or geese, or less than three weeks to hatch those of quails. Under domestication, instincts are modified — in some cases intensified, in other cases weakened, so that it might appear that certain instincts are acquired, and others lost. Thus, animals can be taught many things they do not know by nature, and which they will continue to do as if from instinct.

The conditions for the manifestation of instinct are stimuli, external or internal, which incite the impulsive action of the organism. Thus, a young dog of sufficient age will bark at a stranger, though he has never barked before or heard any other dog bark. Birds of passage, incited by the increasing cold of autumn, take flight for warmer climes.

Examples of instinctive actions may be found in the construction of the spider's web, birds nests, and honey comb, and in hibernation and migration.

As we rise in the scale of being, instinct diminishes and intelligence increases till we reach man, who, though exhibiting traces of instinct, is especially characterized, not by instinct, but by reason.

The difference between man and the lower animals is strikingly apparent:

1st. Animals, in caring for their offspring, are concerned alone with their physical wants, and with these, only till they are able to care for themselves; whereas,

the solicitude of human parents for their children extends also to their intellectual, social, moral, and spiritual welfare, and continues unabated till the end of life.

2d. The thinking of animals, if thinking it may be called, is from particulars to particulars; whereas, man generalizes his ideas into concepts, and proves general propositions.

3d. Animals have no language but the instinctive one prompted by nature; while man has developed an artificial language, both spoken and written, admirably adapted to meet his present requirements, and to provide for unlimited advancement.

4th. As to knowledge, animals are stationary, except within narrow limits in the training they receive in domestication, while man is progressive without apparent limit.

5th. Animals are destitute of moral and religious faculties, which are the crowning glory of man.

6th. The training of animals has been accomplished by man, but this training is only within a very narrow range; and when withdrawn, the animal relapses into its original condition. This renders the view that man is the development of an order of animals, very improbable. There was no higher race to train him. He is indeed a high order of animal — a rational animal, a moral animal, a noble animal, but he was created so, as we must conclude, if we regard the facts of the case, to say nothing of the teachings of revelation.

**3. Appetites** are the cravings prompted by the recurring wants of organic life.

Appetites are distinguished from sensations by their periodicity and by the fact that they are cravings directed to the end of satisfying wants, natural or artificial, while sensations may occur at any time and are not characterized as cravings.

Appetites are distinguished from instincts by the fact that they are feelings consciously impelling to their gratification as an immediate end, though undoubtedly they have an ulterior end in the good of the individual or of the species, while instincts unconsciously prompt to actions which secure results that are only means to ulterior ends. Thus, the spider is incited by instinct to weave his web, but by appetite to eat his prey.

The appetites are illustrated by the following cravings — for sleep, for exercise, for rest, for food or drink.

The periodicity of the appetite for sleep is notorious. After a certain period of wakefulness, there is a craving for sleep, which becomes more resistless the longer it is frustrated, unless determined effort or a new excitement causes a reaction, which may, for a time, dispel drowsiness.

The craving for the alternations of exercise and rest have the character of appetite, though in a less marked degree. After toil, physical or mental, there is a craving for rest; and, after sufficient rest, there is a prompting to activity. It should, however, be kept in mind that the function of rest is to recruit exhausted energy, and to prepare it for further action. Though there is satisfaction in rest, when it is needed, yet the pleasure it affords is by no means so exhilarating as that which springs from the normal activity of vigorous powers.

Hunger and thirst afford the best examples of appetites. These are familiar on account of their frequent occurrence and decided character. Mr. Bain well says, "In the case of hunger, there is a double spur to the taking of food; first, the stimulus of uneasiness, and next, the impulse arising out of the pleasure of eating. It is well understood that these two things are quite different, and on their difference hangs the whole art of refined cookery. Very plain food would satisfy the

craving for nutrition, but there is a superadded pleasure that we have to cater for." *Senses and Intellect*, page 243.

The appetites have the following characteristics:

1st. They are physical as to their origin, conditions, and immediate ends.

2d. They are not continuous but periodical in their manifestations.

3d. As craving, or sense of want, they involve uneasiness or discomfort, and their gratification is attended with satisfaction or pleasure.

4th. The end of appetite is both immediate satisfaction and ulterior good, either to the individual or to the species.

Appetites may also be considered as natural or acquired. The natural appetites are the gifts of God, and may be innocently gratified, in due moderation, if in their gratification no moral law is violated.

The excessive gratification of appetite leads to sluggishness, gluttony, debauchery, and degradation.

Acquired appetites are modifications of natural appetites, directed towards specific objects. In certain cases, they are harmless, as when the appetite is cultivated for a certain kind of food, as tomatoes, not at first relished. More frequently the acquired appetites are harmful, as those disgusting and degrading appetites for tobacco, opium, and intoxicating drinks. These appetites become morbid and well nigh uncontrollable. Even the natural appetites for food and drink may be indulged to excess, leading to gluttony, a vice more respectable than drunkenness, more common, and hence, perhaps, more generally disastrous.

Acquired appetite may be transmitted, and thus become hereditary — a fact which, in the case of vicious appetites, ought to lead to reflection and reformation.

Simple habits are powerful in their influence; but how much more irresistible do they become when urged on by the cravings of an insatiable appetite!

The cravings of appetite are guides to proper action only in case the appetite is natural or unperverted. Diseased or perverted appetites should never be gratified, or rather they never should be acquired; but whether acquired by the individual, or inherited from his progenitors, they should be corrected as soon as possible; for the end thereof is death. It is discreditable to humanity that perverted appetites are common among men, but are rare, if not entirely unknown, among brutes.

As appetite may intensify and strengthen habit, so may habit, acquired by forethought and persistent effort, restrain, modify, or even overcome perverted appetite, inherited or acquired. This fact affords a ground of hope to those who are enslaved by degrading appetite. It is possible to be free.

## CHAPTER II.

### VITAL FEELINGS.

**The vital feelings** are those feelings which are especially related to the vigor of the organism. They are the feelings induced by the states of rest or fatigue, vigor or languor, health or sickness, and by those more permanent states called temperaments.

**1. Rest and fatigue.**—The feeling of rest comes as a consequence of ceasing, for a time, from labor, and indulging in repose. It is both agreeable and stimulating. After due rest, there is felt an incentive to renewed activity. This activity, if not excessive, is itself a source of enjoyment, till the vitality accumulated in rest is so far exhausted that demands are made on the reserve forces of the system. Activity prolonged beyond this point brings on a feeling of fatigue, which may be protracted till exhausted nature refuses longer to work, when rest again becomes imperative. In practice, labor is seldom carried to the point of exhaustion, but it is frequently carried beyond the point where rest would be beneficial.

**2. Vigor and languor.**—These states are analogous to the preceding, but are, in general, of longer duration. A man's general condition, for a protracted period, may justly be described as vigorous; and yet, in this period, he may experience many alternations of rest and fatigue. Vigor is that general condition in which vitality predominates over decay. The feeling of vigor is exhilarating, and impels to activity and achievement. Languor

is a consequence of low vitality. The tone of the system is relaxed, and there is a tendency to decay. The feeling of languor is depressing, causing an aversion to activity, and a desire for repose. It is the consequence of more general conditions than those of a feeling of fatigue, which may be induced by a few hours of labor, and dispelled by a few hours of rest. It can be overcome only by restoring tone to the system.

**3. Health and sickness.**—These are opposites. Health is the state characterized by the felicitous performance of the vital functions. It is the normal condition of a human being. Sickness may be regarded as an abnormal condition of the living organism attending disease or injury. The feelings attending health are agreeable and exhilarating, and, when invigorated by rest, prompt to active exertion. The feelings attending sickness are depressing, disagreeable, and often painful, even to the limit of endurance. They are more marked than those of health, since it is a law of human nature, that the unusual and the abnormal are more noticeable than the usual and the normal.

The feelings of sickness have also a far greater variety than those of health. Each of the innumerable multitude of diseases has its special symptoms, and is attended by its peculiar feelings, which, to be realized, must be experienced.

For a classification of diseases, and a description of their symptoms and accompanying feelings, the reader is referred to works on pathology.

**4. Temperaments.**—Temperament denotes an original quality of the constitution supposed to be due to the predominance of one or more of the vital systems—the respiratory, the circulatory, the nutritive, the nervous, and the muscular, modified also by the conditions and relative proportion of the solids and fluids of the system.

It is more fundamental and permanent in its influence than the preceding conditions, and its effects are more difficult to trace.

1st. There are four *simple* temperaments—the sanguine, the bilious, the lymphatic, and the nervous. Of these, two have been regarded as primary,—the sanguine and the bilious; and two as secondary,—the lymphatic and the nervous, called also the encephalic. Even the bilious has been by some regarded as a modification of the sanguine, produced by external influences.

(1) The *sanguine* temperament is characterized by the predominance of the respiratory and the circulatory systems, whose centers are the lungs and heart. It is indicated by a strong and rapid pulse, plump figure, fair skin, light eyes, soft and light hair, approaching red, a cheerful disposition, and a love for pleasure. This is the prevailing temperament of the English people. Combined with a well-developed muscular system, it constitutes, in the absence of mental culture, the athlete, a well developed animal with little mind.

(2) The *bilious* temperament, due to the predominance of the nutritive system, is characterized by strong pulse; skin, hair, and eyes dark; flesh muscular rather than fat, strong passions, inflexible will, and boldness of character. This is the temperament of those born to command.

(3) The *lymphatic* temperament results from the great relative proportion of the fluids to the solids, in consequence of the activity of the secreting system and the inactivity of the absorbents. It is characterized by well-rounded figure, shapeless person, adipose tissue, full cheeks, flabby muscles, and soft skin. It is aggravated by wealth, and begets a desire for an easy life, but is not incompatible with many good qualities. It is the temperament of a mandarin.

(4) The *nervous* temperament is characterized by a prominence of the nervous system. It is indicated by a slender person, narrow chest, light hair, and mental vigor. This is the usual temperament of the artist and the scholar.

2d. The *compound* temperaments result from a union of the simple temperaments, giving rise to binary, tertiary, and quaternary combinations. They exhibit the characteristics of their components mutually modified.

Of the compound temperaments, it will suffice to notice the following:

(1) In the *sanguine bilious* temperament, the hair, the eyes, and the complexion are light or dark, according to the preponderance of one or the other of the components. The head is compact, and the muscles are firm. It is a good combination, and is found in many great men, giving them a natural superiority.

(2) In the *sanguine lymphatic* temperament, the person is plump, the head round, the chest full, and the complexion fair. Though it is frequently attended with beauty of person, it is an unfavorable combination, tending rather to criminal pleasure than to noble achievement. It is favorably modified by an earnest life.

(3) In the *sanguine nervous* temperament, the person is slight, head narrow, forehead high, the skin light, the muscles feeble, the disposition amiable, and the character too gentle for successful contests with the stern realities of life. Persons of this temperament are better fitted for the counting room than for the open field.

(4) In the *bilious lymphatic* temperament, the person is full, head rounded, hair and eyes dark, and the muscles, though well developed, rounded over with adipose matter. Persons of this temperament are usually sound in judgment, conservative in opinion, and prudent in conduct.

(5) In the *bilious nervous* temperament, the person is slender, the head high, the hair and eyes dark; and the muscles firm though slender. Persons of this temperament are inclined to moral enterprises and to achievements which tend to advance the welfare of mankind.

(6) In the *sanguine bilious lymphatic* temperament, the forehead is low and retreating, the lips thick, and the form and disposition that of the prize-fighter.

(7) In the *sanguine bilious nervous* temperament, the person is well formed, the head large, the forehead high and expanded, indicating great physical and mental power and fertility in resources.

(8) In the *sanguine nervous lymphatic* temperament, the head is large, forehead high and broad, indicating great capacity for literary pursuits, but less adaptation to the external contests of life.

Marriage alliances contracted between persons of similar temperaments are supposed to be unfavorable to the well-being of the offspring.

The *disposition* of a person is largely determined by health and temperament. It may be cheerful or morose, generous or miserly, sedate or volatile, good-natured or quarrelsome, pleasant or peevish, etc. It may, however, be modified or controlled by the will, or even permanently changed by persevering effort which has become habitual.

## CHAPTER III.

### PSYCHICAL FEELINGS.

**An emotion** is the agitation of the sensibility, purely psychical, seeking neither, as in desire, to bring something to the subject, nor, as in affection, to go out to an object. Though a purely psychical feeling, it is preceded by physical conditions, and accompanied or followed by physical effects, as the blush accompanying shame, or the blanched cheek attending fear.

**Pleasure and pain.** — In addition to the peculiar characteristics of the several emotions, they are, for the most part, attended with pleasure or pain, which are contraries, not contradictories, since certain emotions, so far as pleasure or pain is concerned, may, perhaps, correctly be regarded as indifferent. Let us, in a brief digression, consider the theory of pleasure and pain.

**Pleasure** is the reflex feeling which accompanies normal activity or passivity. It results whenever an object induces, in due degree and duration, the energy of one or more of the active powers, or the excitement of one or more of the passive susceptibilities. The pleasure is the most complex and agreeable when the object is of such a character that it involves the greatest number of powers or susceptibilities, and induces such energy or excitement as is neither excessive nor defective, either in degree or duration. By excess, we are to understand a greater degree of intensity or a longer period of duration than the constitution of the power or susceptibility can endure without injury. By defect, we are to

understand a less degree of intensity, or a shorter period of duration, than the full gratification of the power or susceptibility requires.

It is to be remarked that, in general, the degree of intensity varies inversely as the duration of the energy or excitement, and the number of powers or susceptibilities involved. The most intense pleasures are short lived. They can not be long endured. The soul returns with satisfaction to the less intense, but more prolonged, enjoyments.

**Pain** is the reflex feeling which accompanies abnormal activity or passivity. It results whenever an object induces, in undue degree or duration, the energy of one or more of the active powers, or the excitement of one or more of the passive susceptibilities. Not only does excess or defect, in either the degree or duration of the activity or passivity, diminish or frustrate the pleasure attending normal activity, but it induces irregular or abnormal action, thus causing pain. Injury or lesion of any portion of the physical system is also a cause of pain, often intense and prolonged. The soul sympathizes and suffers with the body.

Pleasure and pain are both positive elements in feeling, and each appears augmented when in antithesis with the other.

As our views enlarge and embrace the future, our conceptions of pleasure and pain naturally lead to those of happiness and misery, which are not mere momentary pleasures or pains, but are more abiding satisfactions or discomforts.

There is a tendency to exercise our strongest faculties, since these afford us our highest pleasure, and to leave dormant those which most need cultivation, since their exercise is attended with difficulty, labor, or even pain.

The emotions may be divided into several classes:

**1. Emotions arising from general conditions.**

1st. *Cheerfulness* is a state characterized by joyous emotions of moderate intensity and indefinite duration. It may arise from good health, sanguine temperament, amiable disposition, good fortune, satisfactory social relations, or good prospects for the future.

*Dejection* is the opposite of cheerfulness, and is caused by contrary conditions.

Content or discontent, gladness or depression, joy or sorrow, rapture or melancholy, may be regarded as having the same general characteristics as cheerfulness and dejection, each, in general, more intense than the preceding, though usually less prolonged.

In youth, these states are transient and are affected by slight causes, though, at this period, cheerfulness and joy prevail. In mature years, these states are usually more permanent, and less easily affected, but not infrequently sadness and melancholy prevail.

2d. *Self-satisfaction* is the emotion which a person feels in view of his excellences, real or imaginary. It may arise in consideration of physical perfection—strength, agility, or beauty,—or from intellectual endowments or attainments—genius, talent, knowledge, skill, or accomplishments.

*Self-dissatisfaction* is the emotion which a person feels in view of his defects. It is the opposite of self-satisfaction, and arises from contrary causes.

*Self-complacency* arises when, on the whole, we are satisfied with our past life; and *self-displacency* when we are dissatisfied.

*Self-congratulation* or *self-reproach* arises in view of a deed nobly or ignobly done. *Exultation* or *chagrin* arises in view of success or failure, irrespective of moral quality.

*Self-sufficiency* or *self-depreciation* arises from a confidence or distrust in our abilities.

**2. Æsthetical emotions.**—These have reference to the sentiment of taste, and to the different forms of the beautiful.

1st. *Novelty* awakens and gratifies curiosity. A novel object is sure to attract attention and to excite wonder; but if it has no other merit, its notoriety and the curiosity which it excites will be short-lived. It is, however, preferable to dull monotony, which results in weariness and *ennui;* but even *ennui* is useful as a stimulus to action.

The effect of novelty is due to previous ignorance, and is dispelled by knowledge. Familiarity soon deprives novelty of its charms. This is seen in the fickleness of fashion.

Novelty affords little pleasure to the philosophic mind, since such a mind seeks rather for agreement, general principles, universal law, than for disagreements and novelties.

The curiosity excited by novelty is frequently a vulgar desire for gossip, characteristic of a mind weary of dull monotony, and ignorant of the rich sources of truth and beauty found in nature, science, literature, and art.

Novelty often marks the decay of art. The lack of originality and beauty is supplied by the new and the startling, which, for the lack of merit, soon lose their hold on the attention, and are displaced by something still more fantastic.

*Association* has much to do with the pleasure of taste. It throws around certain objects the dignity of rank, wealth, genius, or worth, and around others the degradation of poverty, ignorance, or vice.

*Fashion* is governed chiefly by novelty and association. The leaders seek in novelty that which will distinguish them from the vulgar; but the common herd follows, through the influence of association, till general

conformity forces the leaders to seek distinction in other novelties, perhaps less beautiful, or still more devoid of good taste.

*Habit* and *custom* have a powerful influence on the pleasures of taste. Habit is tendency acquired by repetition, and is applicable to the individual. Custom is the habit of society.

Fashion and custom are antagonistic. Fashion seeks the new. Custom clings to the old. The one has greater influence in youth; the other in mature years. Fashion has the greater influence in dress; custom, in architecture, in manners, and in etiquette.

2d. *Wit*, *humor*, *ridicule*, *the comic*, *the ridiculous*, are sources of the pleasures of taste, though not of a high order. They elicit attention, provoke laughter, and, as affording pleasure, have their place, so long as they do not degenerate, as they are liable to do, into the trifling, the low, the malicious, or the immoral.

3d. *Variety in unity* is a source of æsthetic pleasure. By unity we are to understand, not the absolute simplicity of the object, but the union of the parts in the whole—many members in one body, *E pluribus unum*.

Variety in unity is always pleasing in the scope which it gives to the intellect in tracing relations and adaptations. The unity in variety may be seen, with increasing admiration, as the scale is enlarged from the individual to the family and dwelling, the citizens and the state, the human race and the world, rational beings and the universe.

*Harmony* is the concord of diversity, and may relate to tone, color, form, character, or relation. Multiplicity without relation and adjustment of individuals, as a disordered mass, is unattractive and displeasing.

*Grace*, the harmony of attitude or movement, both soothes and delights the emotions. It is seen in the free

movements of nature — the winding rivulet, the swaying branches, the curling smoke, the fleecy cloud, the gambols of the lamb, the circling flight of the bird, or in the plays of children. It is seen as art in the attitudes and gestures of the orator.

*Contrast*, in things beautiful, is a source of pleasure by giving play to thought, and by heightening the effect of the contrasted objects.

4th. *Regularity*, *proportion*, or *symmetry* has each its peculiar effect. Regularity affords pleasure in revealing law, and order, and utility. Proportion, the harmony of the whole and parts, and symmetry, the harmony of part with corresponding part, attract and please, while deformity repels and offends.

5th. *Beauty* is that form of expression of idea, thought, or design, which affords a universal, disinterested, and necessary feeling of satisfaction. It is a general quality, including all the sources of æsthetic pleasure.

Beauty is found in various forms, and in countless varieties of objects from the crystal to the human face divine. Thus, we have the beauty of color, light, and shade, addressed to the eye; the rythm of poetry, and the harmony of music, addressed to the ear; the smooth, velvet surface, addressed to the touch; the agreeable flavor or odor, addressed to taste or smell. Indeed, the word *æsthetics*—the name of the science of the beautiful—indicates that the senses are the avenues through which beauty approaches the mind. The agreeable æsthetic feeling has its origin in the alternate excitation and rest of the nerves of the several senses. The repose after stimulation restores the susceptibility and reactive power of the nerves, and prepares them for fresh excitement. The mind, in sympathy with the sensorium, anticipates the renewal of the stimulation, enjoys the sensation consequent upon the excitement, and is disappointed at its

non-recurrence. Hence arises the pleasure from the rythm of poetry, of music, and of the dance, and the displeasure from discord.

The beautiful is not realized by itself. It is always some object which has an end or purpose, which exhibits an idea or thought, design or skill, that awakens in the beholder the emotions of beauty.

Beauty is subject to limitation or restraint. Infinite profusion would overwhelm the finite faculties of man. Both nature and art observe the law of economy — nature, in seeming accommodation to human limitations; art, from necessity.

Beauty seeks the alliance of that which has intrinsic dignity — natural, intellectual, or moral worth; and on such objects, both nature and art display their power. It shuns the ignoble and the degraded.

6th. The *grand* and the *sublime* exalt the thoughts and ennoble the emotions. Objects of surpassing greatness are sublime — the plunging cataract, the lofty mountain chain, the broad expanse of ocean, the movement of armies and shock of battle, the flash of lightning, the roar of thunder, the concussion of the earthquake, infinite space, endless duration, and omnipotent power. Beauty charms and soothes; sublimity elevates and awes. The one is gentle and abiding; the other, powerful and short-lived.

Unpleasant æsthetical emotions are excited by monotony, by deformity, by ugliness, by discord, by degradation, and by decay.

The elements of poetic imagery are originally derived through sense perception. Note the contrast of the poetic and unpoetic words — pink, scarlet, crimson, purple, violet, blue, green, azure, orange, or golden, — dun, brown, drab, bay, or black; lustrous, luminous, sparkling, twinkling, pearly, or silvery, — dull, dingy, or tur-

bid; curving, winding, curling, flowing,—straight, stiff, or angular; clear, soft, musical, mellow, melodious,—shrill, harsh, hoarse, grating; smooth, soft, velvety,—rough, harsh, coarse; luscious, sweet, delicious,—sour, bitter, acrid; fragrant, perfumed, sweet-scented—pungent, stifling, suffocating.

The conditions for the gratification of the pleasures of taste are found both in nature and in art;—in nature, through countless diversities of landscape, adorned with hill and dale, and winding stream, and silvery lake, and distant mountain range, with azure sky and floating clouds, with trees and bowers, with fields of grass and waving grain; with living forms, and hum of bees, and song of birds, and merry sports of childhood; in art, in grounds and dwelling, park and palace, in matchless form of sculptured marble, in speaking canvass, in the melody of the human voice or harmony of orchestral band, in persuasive words of eloquence, or in the divine creations of poetic power.

Novelty excites surprise and gratifies curiosity; beauty and sublimity awaken admiration.

**3. Ethical emotions.**—The intellect discovers the fact that man is under law, divine and human; that the divine law, whether revealed in nature, in the constitution of man, or in the written word, has for its end the welfare of the human race; that human law, though more or less imperfect, has the same end, and in the main is conducive to human happiness; that it is, therefore, right to obey just law, and wrong to disobey, and that we should endeavor to promote the general good.

Ethical acts are accompanied by three distinct classes of ethical emotions, or phenomena of conscience.

1st. Preceding the act, there is a sense of obligation to do the right and to avoid the wrong.

2d. Preceding, accompanying, or following the act,

there is a sense of responsibility, either to divine or human authority, for moral actions, whether right or wrong.

3d. Following the act, there is a sense of recompense —for a right act, the approval of conscience, of our fellow-men, and of God,— for a wrong act, the disapproval of conscience, in a sense of guilt, of shame, of regret, or of remorse, also the disapprobation of our fellow-men, and of God.

## CHAPTER IV.

### PSYCHICAL FEELINGS.

**Affection** is, in general, either love or hatred of an object. Emotion is, as we have seen, an agitation of the sensibility. It may be compared to ripples upon the surface of water.

An *affection* is an emotion with a current directed outward, and terminating on an external object.

A *desire* is an emotion with a current directed inward and terminating on self.

**Passion** is violent and controlling affection or desire.

**Inclination** is the tendency of the affections or desires to affect others or to gratify ourselves.

**Disposition** is the prevailing spirit or character.

**Propensity** is the constitutional bent or proneness which gives direction to the inclinations.

The affections are divided into two general classes — the benevolent affections, characterized by love, and the malevolent, characterized by hate.

1st. *The benevolent affections.* A benevolent affection is an interest in an object, an inclination towards it, an attachment to it, with a disposition to care for it, or do it good.

The inclination, attachment, and benevolent intention, naturally, though not necessarily, follow from the interest which the object excites. Though the benevolent affections may, in general, be characterized as love, yet they are more definitely designated by specific names:

(1) *Sympathy* is feeling with others as they feel. It

originates in the social nature of man, and is fostered by the satisfaction which arises when our feelings harmonize with the agreeable feelings of others. It is not, however, limited to feelings of pleasure, but is extended to those of distress. Through sympathy, we not only rejoice with those who rejoice, but weep with those who weep.

Personal experience, or at least some knowledge or conception of a feeling, is a condition of sympathy in respect to that feeling. We sympathize more readily with others in those feelings which have deeply affected ourselves or those with whom we are acquainted.

Certain signs are associated with certain feelings, and are their indications. Perceiving these signs, we infer the feelings, and enter into sympathy with them. A knowledge of these signs is essential to sympathy.

Persons susceptible to external influences, especially if they are also characterized by a refined sensibility, are usually more sympathetic than others, though their sympathy may be superficial and evanescent, like the sympathy felt for strangers; but the sympathy between friends of kindred spirit is deeper and more abiding.

Community of interests, of circumstances or opinions, of hopes or fears, tends to augment sympathy.

The tendency to sympathy is checked by press of business, a selfish disposition, irascible temper, avarice, ambition, or disparity in age, education, temperament, or social position.

Not only does inordinate self-regard diminish sympathy, but also self-abnegation. The hermit or anchorite is not in sympathy with mankind.

(2) *Pity* is the sympathy with others excited by their sufferings. It regards its object, not only as suffering, but as weak or helpless, and hence as inferior, at least, in regard to that which awakens pity. Though a be-

nevolent sentiment, it is, in regarding its object as inferior, allied to contempt. The condescension implied in pity is humiliating to a high-minded sufferer. He does not like to be pitied, though he may desire to be relieved. The sense of humiliation in being pitied is usually obviated, to some extent at least, either by the intensity of the suffering, or by habitual admission of inferiority on the part of the object of pity.

(3) *Compassion* is sympathy excited by misfortune, and extends to persons in all conditions — inferiors, equals, or superiors. It is a feeling akin to pity; but pity may be a mere sentiment, a sympathetic emotion, resulting in no effort for relief; but compassion prompts to an effort to relieve the distress. The priest and the Levite, no doubt, felt pity for the man who fell among thieves, yet they passed by on the other side; but the good Samaritan had compassion on him, and went to him, and dressed his wounds, and poured in oil and wine, and put him on his own beast, and took him to an inn, and paid for his care.

A benevolent heart, in performing acts of compassion, will guard against wounding, by a display of condescension, the self-respect of those whom he relieves. If, however, pride in the sufferer is overborne by his sufferings, and anxiety for relief, the display of condescension may be disregarded or overcome by a sense of relief and gratitude to the benefactor.

(4) *Mercy* is compassion extended to fallen enemies or to those exposed to suffering for demerit, by one who has the means of vengeance or the power to remit or mitigate the penalty. Pity may be bestowed when justice forbids mercy; it is felt, even for one who suffers for crime, though it is augmented by extenuating circumstances; but mercy seeks for those extenuating circumstances as a justification for mitigating the penalty.

Though justice forbid mercy, compassion offers consolation and softens the rigors of the penalty.

Pity, compassion, and mercy, though differing in their manifestations or in their objects, have the common element of sympathy with others in their distress. Pity may be felt for men or even brutes, though affording no relief. Compassion for any object in distress, seeks to relieve the distress. Mercy is extended to those in our power, whether enemies or criminals, in forgiveness of injury, or in remitting or mitigating the penalty of violated law.

God pities the miseries of mankind, shows his compassion by relieving our distress and by his bountiful provision for our wants, and exhibits his mercy in the forgiveness of sins.

(5) *Gratitude* is the feeling experienced towards a benefactor for benefits conferred. It involves satisfaction in the benefit received, admiration for the generous deed, esteem for the benefactor, and a desire to make suitable returns.

(6) *Thankfulness* is a sense of kindness received, and a readiness to acknowledge it in words or other appropriate signs.

Genuine thankfulness may be regarded in its manifestations as the expression of gratitude; but the form of thankfulness may be employed, when gratitude is not felt. A profusion of thanks may be offered by one whose conduct proves him to be ungrateful.

Regarding mere thankfulness as an imperfect return for benefits received, gratitude seeks to make more adequate returns in appropriate deeds.

The common sentiment of mankind approves of thankfulness, but demands gratitude. Unthankfulness is regarded as a breach of etiquette; ingratitude is branded as a moral baseness.

(7) *Esteem* is the regard which we feel for others in consideration of their excellences of character. Though entering as an element in gratitude and friendship, it is not identical with either, since it may be felt in the absence of benefits received or of personal attachments. It can be called out only by good qualities, real or supposed, in the object of esteem.

(8) *Friendship* is the mutual attachment of two persons who have esteem, regard, or predilections for each other, exclusive of natural relationship or the tender passion of love. It presupposes an intimate acquaintance, and finds expression in the reciprocation of kind offices. It implies community of feeling, congruity of character, and mutual sympathy; though, in many respects, true friends may be diverse, or even the complements of one another, each supplying the deficiencies of the other, and admiring in the other what is lacking in himself.

True friendship is the mark of a generous and noble character, and can be felt by no other. A person destitute of true friends is certainly wanting in generous qualities, and is an object of pity.

Appreciation of high and noble qualities in another, though an essential condition of friendship, is not identical with it, since it may exist when friendship is wanting. True friends will stand by one another in adversity, that test which distinguishes false friends from true. Nothing but an unexpected discovery of unworthiness in the character of one of the parties, showing that the other was mistaken in him, or that he is not what he once was, will sever the tie of friendship, and even then he will always be regarded with a melancholy interest which would manifest itself in deeds of kindness. The friend of former years can never be regarded as an alien or a stranger.

Friendship seeks the good of the object of its regard, and is disinterested and self-sacrificing. It is not blind to faults, but sees them and endeavors to correct them, and thus to render the object of regard more worthy.

Friendship is progressive. Time strengthens and confirms it, and renders it proof against the rude blasts of adversity. It sympathizes both in joy and in sorrow, rejoicing in the one, affording consolation in the other.

The question has been raised whether friendship can be cherished between more than two persons. The number of persons towards whom a warm friendship can be cherished is not indeed very great; but there is no reason why the number should be limited to a single individual. The acquisition of a new friend does not imply the loss of an old one, neither is it a just cause of jealousy. In this respect, friendship differs greatly from love between persons of opposite sexes, which, in the very nature of the case, is exclusive.

(9) *Self-love* is that form of love in which the subject and the object are identical. It is the regard of the individual for himself, and leads him to guard against danger and to seek to promote his own happiness. Self-love is said to be the first law of nature. It is either due or undue.

*Due* self-love, or self-respect, which guards our own welfare and restrains us from whatever is debasing, is proper and commendable. The injunction, Love thy neighbor as thyself, implies that, within reasonable limits, it is right to love ourselves. We are at liberty to promote our own interests, when, in doing so, we do not disregard the interests of others. True greatness is modest, generous, and self-sacrificing.

*Undue* self-love is *selfishness*. It seeks our own gratification, regardless of the rights of others.

It is *egotism* when it seeks to make one's self conspic-

nous, and obtrudes the great *I* whenever it finds an opportunity.

It is *haughtiness*, when it looks down with contempt upon others regarded as inferior.

It is *pride* when it exalts self, and glories in its own importance or achievements, exclaiming, "Is not this great Babylon that I have built for the house of the kingdom, by the might of my power, and for the honor of my majesty?"

It is *selfish ambition*, when, for self-glory, it seeks for ecclesiastical, political, or military power, regardless of the misery which it causes.

(10) *Conjugal love* is the reciprocal attachment of two persons of opposite sexes, who are united by the marriage engagement or tie. It is, perhaps, the strongest affection of the human heart.

There is a natural affinity or attachment between the sexes; and if a marriageable man and woman of suitable ages and social position, entertain mutual friendship, no other attachment intervening, that friendship is almost certain to develop into love.

This affection, awakened by mutual attraction, and intensified by restriction to a single object, becomes, by action and reaction, an all-controlling passion. The lovers are blind to each other's faults, and each sees in the other the perfection of every excellence.

Conjugal love ought to be enduring as life, and will be thus enduring if the parties are well mated, considerate, forbearing, and true. But how often is the ardent love before marriage transformed into indifference or hate! Its very ardor and intensity is unfavorable to its constancy. More selfish than friendship, love is exclusive, easily excited to jealousy, and brooks no rival.

Friendship demands genuine virtues, and is confirmed and tested by time; but love, capricious and inconsider-

ate, blind to faults, deaf to advice, too often sows to the wind and reaps the whirlwind.

(11) *Parental and filial* love is that love which exists between parents and children — parental, the love of parents for their children; and filial, the love of children for their parents.

It is an instinctive feeling, exhibited by the lower animals as well as by man; but in the lower animals, it ceases when the young are able to care for themselves, while, in man, it is not only an instinctive feeling, but a rational sentiment, as enduring as life itself.

This affection seems to have been implanted by the Creator for the wise purpose of caring for the young and preserving the species.

Parental love is stronger than filial, and maternal than paternal. With what unceasing care the mother watches over her children through the years of helpless infancy and dependent childhood!

The feeling of parental and filial love is strengthened by the relation of the parties as protector and protected, by association and habit, by worth in the parents and dutiful conduct in the children; but that these circumstances do not constitute the affection, or wholly explain it, is evident from the difference between the feeling towards one's own child or parent and that with which a step-child or a step-parent is regarded.

(12) *Fraternal love* is the love existing between brothers and sisters. Though less intense than conjugal, parental, or filial love, it is a beautiful sentiment, and is abiding as life.

The family affections — conjugal, parental and filial, and fraternal love, constitute a group by themselves. They exhibit divine wisdom in their origin; and, surviving the loss of Eden, continue to work for the good of the race.

The affections, the source of the dearest joys of life, are also the occasions of the sharpest pangs. Sorrow for the loss of friends refuses to be comforted, save in the hope of a reunion in a future life. The fact that love outlives the natural life of the person loved, is in harmony with the doctrine of immortality, but is out of harmony with the gloomy view that death is an eternal sleep.

(13) *Philanthropy* is the love of mankind. It is a broad and generous sentiment, neither bounded by state lines, nor restricted by language or race. It is the power which moves a Howard or a Wilberforce to deeds of love, and gives him a place in the hearts of mankind. Our philanthropic impulses are often overborne by narrower or more selfish feelings.

(14) *Patriotism*, or love of country, is a noble sentiment. Though inferior to philanthropy in breadth, it is superior to it in depth. It has for its object the good of country, and is gratified with national prosperity, and stirred to self-sacrificing activity in times of national peril.

In times of peace, men are engaged with their own pursuits, and the sentiment of patriotism slumbers; but if the country be threatened with invasion, or if its life be imperiled by rebellion, the slumbering fires of patriotism will burst forth into flame, and, through sympathy, patriotism becomes contagious.

(15) The *love of home* is kindred with that of patriotism, but warmer, and, in ordinary cases, more intense.

*Nostalgia*, or home sickness, indicates the strength of the affection for home. It more severely affects the uncultivated than it does the cultivated — those who through knowledge and discipline have resources of happiness within themselves.

(16) *Piety* is love for God. It is a complex affection involving *reverence*, or profound respect, for the divine character; *adoration*, or worship of Him as Supreme;

*gratitude* for mercies and blessings received; and *trust* in God, or confidence of safety and welfare under his protection and providence.

True love to God prompts to obedience to the divine laws, and stimulates every noble sentiment.

2d. *The malevolent affections.* A malevolent affection is a feeling of resentment awakened by an object which disagreeably affects us.

The most favorable view that can be taken of them is that they serve the purpose of inciting to prompt action in case of sudden personal danger, and that they lead to the detection and punishment of crime, and thus to the protection of society. In this light they may be regarded as a natural response to a sense of injury. More frequently, however, they are suffered to control action, when they should themselves be restrained, or directed by reason. Though originally constituted by the Creator for wise purposes, they have been perverted by sin, and have become the occasions of evil.

(1) *Dislike* is the repugnance felt towards an object which displeases. It is more than the negative indifference with which those objects are regarded which neither awaken desire nor call forth the benevolent or malevolent affections.

Something in an object awakens unpleasant feelings which find expression in some token of disfavor. The feeling is not positive hatred, but there is aversion or a disposition to repel the object.

(2) *Antipathy* is a strong dislike, indicating not only a want of sympathy, but positive disagreement or discord. In certain cases it may be regarded as constitutional, since no other reason can be assigned for it. Certain persons feel antipathy to others at first-sight, so do certain animals.

(3) *Contempt* is the feeling of dislike and disapproba-

tion manifested towards those who are considered base. These are regarded as justly deserving to be branded for their meanness. It is not external circumstances, such as poverty or mental inferiority, that render a person an object of contempt, but baseness of character, or intentional meanness of conduct.

Contempt is not incompatible with the hope that the obloquy cast upon the person may cause a reaction of his moral nature leading to reformation. When a person is despised as beneath contempt, he is regarded as hopelessly lost to all that is good.

(4) *Scorn* is the feeling which leads to the rejection of something proffered as unworthy of our acceptance. Contempt implies that something is not good in itself; scorn, that it is not good enough for us. Scorn is altogether a perversion when the wicked scorn the righteous or that which is good.

(5) *Disdain* is the feeling entertained by a haughty person towards others whom he despises as unworthy of his consideration. *Haughtiness* is the effect of pride, and leads to the feeling of disdain for those regarded as inferior, and to an indifference alike to their praise or censure. *Arrogance* is a compound of pride and vanity, and manifests itself in pretensions to superiority and in demands for deference.

A haughty man treats with disdain those whom he regards as destitute of marks of distinction. An arrogant man makes lofty pretensions, and claims superiority for himself, and exacts deference from those whom he regards as his inferiors. The pride of an arrogant man would lead to disdain, if his vanity did not covet praise. His vanity modifies his pride and excludes disdain; his pride makes his vanity arrogant.

(6) *Envy* is the resentment felt at the success or superiority of others. The envious person, seeing in the

success of another his own failure, or in the superiority of another his own inferiority, resents it by attempting to lower him by depreciation, insinuation, or slander.

Envy is always base and degrading. It is without justification or palliation.

The true remedy for envy is to bring ourself up, and not to bring a superior down. If any one would develop, to their full extent, all the possibilities of good in himself, he would find little occasion for envy.

(7) *Jealousy* is a burning desire to possess or to keep something regarded as valuable, coupled with a fear that another will appropriate it to himself.

Envy regards, with an evil eye, the possessions, the success, the reputation, or the superiority of others. Jealousy fears that another may deprive us of what we desire or possess. We may be envious at the success or the superiority of others, when it simply reveals, but does not cause our own failures or inferiority; but we are jealous of the success or the superiority of others when it is believed to sustain to our failures or inferiority the relation of cause to effect. We are envious of superiors in position, influence, or fortune. We are jealous of equals who supplant us or gain at our expense. Thus, one child is jealous if another is praised in his presence, imagining that the other withdraws praise from himself. Those of the same profession, whose success depends, to a great extent, upon their popularity, are most liable to be jealous of one another, as musicians, actors, physicians, or preachers.

The typical case of jealousy is that exhibited by a lover who believes that he is supplanted by a rival in the affections of the one he loves. In this case, the more ardent the love, the more violent the jealousy. Beginning with suspicion, which implies doubt, jealousy becomes furious when evidence dispels doubt, and turns

uncertainty into dreaded certainty, and ardent love into murderous hate.

> "Thy numbers, Jealousy, to naught were fixed,
> Sad proof of thy distressful state!
> Of differing themes the veering song was mixed;
> And now it courted love, now raving called on hate."

(8) *Malice* is ill-will cherished towards others, terminating in evil intent or premeditated injury. Though it may be called out by prejudice, or dislike, or injury, real or imaginary, it springs from a bad disposition, or a wicked heart, and is without justification or excuse. It is exactly the opposite of benevolence, which is the cardinal virtue.

(9) *Resentment* is the reaction of feeling in response to a sense of personal affront or injury. It seeks expression in some form of retaliation. Arising from a sense of wrong received, it tends to continue till the wrong is redressed. Wrongs to our friends are resented, since they are regarded, as in a certain sense, personal. We consider them as wrongs to ourselves.

Resentment implying malice is to be distinguished from *indignation*, or the feeling awakened by the unjust or atrocious conduct of others. Indignation springs from a high sense of honor, and, being exempt from selfish personality, is devoid of malice, and not irreconcilable with a benevolent disposition.

(10) *Hatred* is cherished resentment. It broods over wrong, takes time for consideration, and deliberately plans retaliation. Less violent than anger, it is more lasting. Hatred between individuals leads to feuds between families, and clans, or tribes.

(11) *Anger* is sudden and strong resentment. It often produces intense excitement, and manifests itself in deeds of violence. Anger is usually of short duration; its

very intensity forbids its continuance; hence, it has been defined as a short-lived madness. Anger may, by sudden provocation, be aroused in hearts devoid of malice, but it is unsafe to be subject to its control, since it may lead to deeds which may be the lasting regret of our lives, and which no repentance can remedy.

(12) *Wrath* is heightened anger felt by a superior towards an inferior. It may be displeasure or righteous indignation, devoid of malice, felt towards the guilty, as the wrath of God; but, when provoked by personal injuries, if involving malice, it becomes haughty vindictiveness, dangerous or destructive to its object.

(13) *Rage* is a violent ebullition of anger, breaking out into extravagant expressions and vehement demonstrations of resentment.

(14) *Fury* is excessive rage, lashing the soul to such a pitch of excitement, that it is no longer under the control of reason.

(15) *Revenge* is deep-seated hatred, manifesting itself in retalliation for injuries received. It is a destructive passion, seeking satisfaction in returning injury for injury, and usually with interest compounded. Not satisfied with the retribution which civil or Divine justice will visit upon the offender, it takes upon itself the work of retribution, forgetting that God has said, "Avenge not yourselves, but rather give place unto wrath; for vengeance is mine, I will repay, saith the Lord."

## CHAPTER V.

### PSYCHICAL FEELINGS.

**Desire** is a craving for a supposed good not in possession. The object of desire must either be known or believed to be a good, that is, something whose possession would afford satisfaction, or gratify the feelings. Desire may be regarded as an emotion with a current directed towards self.

**Aversion** is the opposite of desire. It may be regarded as negative desire — a desire to be rid of a supposed evil. The object of aversion must be either known or believed to be an evil, that is, something which would disagreeably affect the sensibility.

In desire, the order is, a supposed good not in possession, an interest in that good or an affection for it, a desire or craving to possess it. In aversion, the order is, a supposed evil, a dislike excited against that evil, and an aversion to it.

Desire attracts; aversion repels. The object of desire pleases; the object of aversion dipleases.

1st. *General desires and aversions.* There are three general classes of legitimate desires and aversions — desire for happiness, for perfection, for usefulness; and aversion to misery, to imperfection, and to uselessness.

(1) A desire for *happiness*, or an aversion to misery, is universal. Man desires not only pleasure, the gratification of a passing hour, but happiness, rational enjoyment; and desires it to be abiding, eternal, which involves a desire for continued existence.

Happiness is attainable only by a compliance with its conditions; but a knowledge of these conditions is indispensable to compliance. What, then, is happiness, and what are the conditions of its attainment? Happiness is the agreeable emotions which spring from the enjoyment of good. It is not quiescence — it does not consist in rest. It springs both from the exertion of our active powers, and from the excitement of our passive susceptibilities.

But neither is every action nor every excitement a source of happiness. Certain actions or certain excitements result in positive misery. Happiness springs only from proper actions or from proper excitements, that is, from such exertion of the active powers or excitement of the passive susceptibilities as are in accordance with the laws of our being. Obedience to law is a condition of happiness, and a knowledge of law is a condition of obedience, and therefore a condition of happiness.

A desire for happiness naturally leads to the desire for those things which confer happiness. An aversion to misery leads to an aversion to whatever is a cause of misery.

(2) A desire for *perfection* and an aversion to imperfection, is natural to man, and is, therefore, legitimate, when not selfishly pursued at the expense of others.

Perfection is either physical, intellectual, or moral, each contributing to the others, all being essential to the perfection of man.

*Physical perfection*, embracing health, strength, agility, and beauty, is rather an *ideal* towards which some progress can be made, than an *end* which can be definitely attained.

A desire for physical perfection tends to guard life and to preserve health and beauty. It prompts to the observance of the physical laws in exercise and rest, in

food and drink, in pure air and proper clothing, and in cleanliness of person.

Physical well-being is favorable to intellectual and moral perfection, and contributes to human happiness.

*Intellectual perfection*, consisting in the symmetrical development and complete control of our mental powers, is a lofty ideal which can be approximated, though never reached. The desire for the attainment of this ideal is an incentive for assiduous culture.

A knowledge of the conditions and laws of happiness is the indispensable condition of obedience to these conditions and laws, and obedience results in happiness. By knowledge, man avoids many evils, otherwise inevitable, enlarges his dominion over the forces of nature, and thus multiplies the sources of enjoyment.

*Moral perfection*, or virtue — integrity of purpose, purity of heart, love to God and to man, uprightness of life, is not only a noble and inspiring ideal, but is, by the help of God, an attainable end.

Moral perfection is a never-failing fountain of pure and unalloyed happiness, and will ensure peace of mind and rest of soul, in spite of poverty, persecution, sickness, loss of friends, or even death itself.

(3) A desire for *usefulness* grows out of man's social relations, and is legitimate and praiseworthy. It naturally leads to thoughtful plans and noble deeds. It stimulates the benevolent affections, which seek the good of others. Its language is, May others be blest, and may I bestow the blessing.

2d. *Special desires and aversions.* The special desires and aversions can be reduced to three classes — desire for knowledge, for wealth, and for power, and aversion to ignorance, to poverty, and to inferiority and obscurity.

(1) The desire for *knowledge* is more than a vulgar curiosity, a desire for novelty. It embraces the wide

field of science, literature, and art, also the professional, commercial, mechanical, and agricultural pursuits.

The desire for knowledge is closely related to the desire for intellectual perfection. It arises from the utility of knowledge, from the constitution of the intellectual powers, from the scope for activity which the pursuit of knowledge affords, and from the pleasure which the acquisition confers.

Knowledge is a power and a great utility—a means of distinction and influence. The activity of the intellect is itself a means of happiness. The field of knowledge, vast and greatly diversified, is a never-failing source of pure enjoyment. The desire for knowledge arises, therefore, naturally from the constitution of man in relation to the world in which he lives. It usually assumes specific forms—a desire for a knowledge of a certain science, art, language, or profession.

In early life, the desire for knowledge partakes more of the character of curiosity; but in mature years, it seeks rather for the practical, and, in some cases, for the speculative and the universal.

Aversion to ignorance is the necessary counterpart of the desire for knowledge. It is also augmented by a consideration of the disabilities attending ignorance.

(2) The desire for *wealth* is natural, and within certain limitations, useful and commendable. It checks vice, promotes industry, and fosters the useful arts.

The pursuit of wealth affords pleasure in the activity which it calls forth. The possession gratifies the desire for its acquisition, affords the means for the gratification of other desires, confers the dignity of independence and social distinction, and supplies the means for promoting the welfare of others.

*Avarice*, or the undue desire for wealth, induces anxious care and slavish toil, begets *covetousness*, or desire

for the property of others, and culminates in a mammon-worship or miserly wretchedness.

Aversion to *poverty*, the necessary consequence of the desire for wealth, is strengthened by a knowledge of the evils of poverty.

(3) *Ambition*, the desire for *power* or *fame*, is a native and powerful impulse to action. The ambition to be useful is a laudable virtue; but selfish ambition is a vulgar vice, detestable in itself, and dangerous to society. The selfish possessor of power is a tyrant, and the ambitious conqueror has been the scourge of mankind.

The desire for the approval of the wise and the good, coupled with an effort to merit that approval, leads to worthy achievement; but *vanity*, the undue desire for the approbation of others, is a weak and silly vice, usually exhibited by those destitute of merit. Coupled with untruthfulness, it leads to deceit or hypocrisy.

Pride desires power; vanity fame. Pride elevates us in our own estimation; vanity seeks elevation in the estimation of others. Mortification is wounded vanity.

Aversion to inferiority or obscurity is the counterpart of ambition, or desire for power or fame.

3d. *Compound desires.* These are hope and fear.

(1) *Hope* is the desire and expectation of good. It points to the future. We do not hope for that which we now possess, nor for that which we either do not desire, or do not expect.

Desire and expectation, the two elements of hope, are not always in equilibrium. Expectation is an intellectual element, and varies with the degree of probability. When the probability is small, the expectation is weak, and we are said to hope against hope, that is, against expectation; but when the probability is great, the expectation is strong, giving the assurance of hope. If the desire is weak, and the expectation also, but little in-

terest is taken; if the desire is weak, and the expectation strong, hope approaches pure expectation; if both desire and expectation be strong, the hope becomes a joyful anticipation.

*Faith* is confidence in a person or thing from which we *hope* to realize some object of desire. The object of hope is a *good;* but the object of faith is a *person* or *thing* regarded as the *source* of good. *Trust* implies the committal of an interest to the keeping of an object of faith.

Hope is a powerful spring to action. The loss of hope usually paralyzes effort; but, when coupled with resentment, it may lead to the rashness of despair.

(2) *Fear* is the aversion felt towards expected evil. Expectation is common to hope and fear, but the objects of expectation, in the two cases, are opposites. In hope, the object of expectation is some form of good; in fear, the object is some form of evil. The desire of hope, and the aversion of fear are also opposites.

*Anxiety* is a form of fear in which the evil is rather possible and uncertain, than probable and expected. It is usually more continued than fear.

*Apprehension* indicates a stronger probability than anxiety. It anticipates danger.

*Alarm* is the fear excited by the presence of sudden danger.

*Dread* is the fear of some impending calamity.

*Terror* is paralyzing fear.

*Horror* is the sympathetic terror induced by the sudden calamity of others.

*Despair* is the absence of all hope of deliverance from present evil. It may result in complete inactivity or it may, as sometimes in war, exhibit prodigious effort known as the courage of despair.

# PART III.

## *VOLITION AND THE WILL.*

## CHAPTER I.

### GENERAL VIEW OF VOLITION.

**1. Phenomena and faculties of the soul.** — We have already found that the phenomena of the soul are reducible to three classes, — cognitions, feelings, and volitions. These phenomena imply three classes of faculties, — the Intellect, the Sensibility, and the Will.

Since the soul has cognitions, that is, since it knows, it has the power to know, or the faculty of knowing, and this faculty is called the *intellect*. Since the soul feels, it has the susceptibility of feeling, and this susceptibility is called the *sensibility*. Since the soul puts forth volitions, that is, since it wills, or chooses between alternatives, it has the power of decision or of choice, and this power is called the *will*.

The faculties of the soul are not divisions of the soul; they are capabilities, or susceptibilities, or powers of the soul. When it is said that the soul has intellect, sensibility, and will, the meaning is, the soul can think, and feel, and choose; but these processes go on together, though one may be more prominent than the others.

In cognition, the soul thinks. The intellect, or faculty of cognition, is the faculty which the soul specially exerts; but the other faculties, the sensibility and the will, are relatively, not absolutely, quiescent. In feeling, the susceptibilities are agitated, and though thought and volition may be present, the phenomena of the sensibility are especially prominent. In volition, the soul exerts its powers of choosing between alternatives, but the in-

tellect and the sensibility are not only not absent, but not even quiescent.

The cognitions make known the properties of things, and thus awaken our appetites, or induce affections and desires or aversions, which become springs to action.

In saying that the will decides which alternative it will choose, the meaning is, the soul exerts its power of choice, called the will, and decides which alternative it will elect.

**2. Definition of terms.** — In order to avoid ambiguity, it is necessary to define the principal terms employed.

*Decision* sometimes signifies an intellectual act, as when a judge decides a question of law, or, in general, when the intellect decides whether a given proposition is true or false; but when used in connection with the will, decision means that we have made up our minds to act or not to act in a given manner; and growing out of this, is a secondary meaning of firmness or adherence to the alternative chosen. A decision to act is always an act of the will; and, conversely, an act of the will always involves decision.

A *purpose* is a predetermination to enter upon a given course of action.

*Intention* is the deliberate purpose to accomplish a certain result.

*Volition* is the intentional decision to act in a given manner. It is the typical act of the will.

*Choice* is the election of one of two or more alternatives in view of motives rationally apprehended.

The relation of choice to volition is that of a species to its genus. Choice is rational volition, electing its alternative in view of reasons. It implies preference.

Alternatives are necessary to choice; that is, where there is no alternative, there can be no choice. Rational motive is also a condition of choice. The term

*rational motive* is here generalized, and signifies motive in view of reasons good or bad.

Volitions may be put forth in view of motives rationally apprehended, or from impulses of the sensibility without reflection, or without motive or impulse. In the first case, the volition is elective; in the second, impulsive; in the third, arbitrary. All volition is *conative;* choice is not only conative, but *elective.*

*Refusal* is the expressed decision not to accept a given proffer, or not to comply with a given request. But to refuse to accept a proffer, is to choose its alternative, not to accept; and to refuse to comply with a request is to choose its alternative, not to comply. Refusing is negative choosing, or choosing the negative. Thus, an apple is offered me, I may either choose or refuse to accept it; that is, I may choose to accept it, or I may choose not to accept it. I may be requested to lend $100, I may either choose or refuse to comply with the request; that is, I may choose to comply with the request, or choose not to comply. To decline to accept an invitation is a polite refusal to accept, expressing the choice not to accept.

More than two alternatives may be presented. Thus, I may choose to take one of two or more apples, or I may choose to take more than one, or I may choose not to take any.

The alternatives here considered are not congruents, but conflictives, and are either contradictories or contraries—contradictories, if but two in number; contraries, if more than two.

Volition is not to be confounded with the external executive act. Thus, the decision to take an apple precedes the act of putting forth the hand and taking it, and is, therefore, distinguishable from the act.

Volition is to be distinguished from desire; for desire

is a craving for an object in view of appropriating it to the use of self; but the decision to act in reference to it is a volition. The object of desire is something considered as a good. The object of volition is the executive act consequent upon the volition. Desires are passively determined by something foreign to self, considered as a good. Volitions are intentionally determined by the will itself, usually in view of motives. Desires are phenomena of the sensibility, and do not necessarily eventuate in action. Volitions are sovereign acts of the will, determining executive actions. In like manner, volition is to be distinguished from aversion.

A *purpose* is, as we have seen, a general choice or predetermination to enter upon a given course of action. It may be regarded as a general volition, determining many subsequent volitions. Thus, the purpose to lead a virtuous life, that is, the general choice of virtue, determines many subordinate choices or volitions.

The *will* is the faculty of volition.

A *motive* is an inducement soliciting the will to choose between alternatives, or to decide to act in a given manner.

The expression *to act* is to be understood in a general sense, and may signify not only to act, but to refrain from acting in a given manner.

To *will* is to decide or to exert the power of volition. To will and to choose are nearly synonymous, differing slightly in their applications. It is correct to say, I choose virtue, not I will virtue, though it is right to say, I will to be virtuous; and this is the meaning of the expression, I choose virtue.

A *preference* is the favor accorded to one alternative in deeming it rather to be chosen than another. It naturally precedes choice.

*Indifference* is the absence of preference. It signifies

that one alternative is neither more nor less to be chosen than another. The opposing motives are equal, whatever be their influence. In this case, as there is really no preference, the alternative may be left to be determined by another person, or by chance, or in general by circumstances foreign to choice, or the person may decide for himself; if so, he decides without preference. It is then virtually volition without motive.

*Inclination*, *propensity*, and *disposition* have already been defined; but it is important to remember that inclination is the reaching forth of the affections or desires for an object; that a propensity is a constitutional tendency to a given course of action; and that disposition is the general attitude of the soul with regard to other things, out of which arises the favor or disfavor with which a given thing is regarded.

**3. Order of the phenomena.**— 1st. *Pre-volitional.* The intellect discovers the properties of many objects which affect the sensibility as agreeable or disagreeable, thus exciting the appetites, and inducing affections and desires or aversions. The appetites crave gratification. The affections and the desires seek those objects which are agreeable to the sensibility. The aversions repel those which are disagreeable.

The appetites, the affections, the desires, and the aversions furnish motives or springs of action which solicit the will to act in choosing between alternatives.

2d. *Volitional.* The soul, as rational, reflects upon these alternatives, and by the power of the will decides which alternative it will choose. The motives do not all solicit the will to choose the same alternative. The will is frequently, perhaps commonly, solicited by conflicting motives. In view of all the motives, the soul prefers one alternative, and exerts its power of will in choosing that alternative, and rejects the other alternatives.

3d. *Post-volitional.* The decision of the will being made in the choice of the alternative, there remains the post-volitional act by which the volition is executed. Thus, having decided to consult a certain book lying at hand, I put forth my hand and take the book, and open it, and read a certain passage.

The threefold phenomenon can be thus simply illustrated. An apple is offered me. My appetite is excited, and a desire for the apple induced, which acts as a motive soliciting the will to decide to accept the offer. No counter motives appearing, or none of sufficient weight, the will decides to accept the apple. It now remains to put forth the hand and take it. This is the external execution of the volition, and is a voluntary action.

## CHAPTER II.

### FREEDOM OF THE WILL.

**1. Nature and limitations of freedom.** — *Freedom* is exemption both from restraint and from constraint, that is, from prevention and from compulsion, whether internal or external.

*Liberty* is external freedom to act as we choose, that is, to execute our volitions. It is freedom from external restraint or prevention, and from external constraint or compulsion. It is not necessarily freedom from all restraint, or from all constraint; for freedom from restraint in doing any particular thing is liberty to do that thing, and freedom from constraint to do any thing is liberty not to do that thing.

A man is not free to appropriate the property of his neighbor without his consent, or to injure his reputation or his person. From such actions he is restrained by civil law. This restraint is not, however, absolute, since he may violate the law; but for this violation, he is subject to penalty. He is not free from contributing his just proportion in bearing public burdens, in defraying the expenses of government. He is compelled to pay his taxes.

Man is not free from obligation to obey the laws of God, but he is free from compulsion. If he violate these laws, as he has power to do, he is not free from the consequences of the violation. Though a man may possibly escape the penalty of violated human law, he can not escape the just judgments of God.

Within certain limits, however, man is free to act as he pleases; that is, he has liberty, so long as he violates no law, to execute his volitions. He can choose his place of residence, and engage, without hinderance, in any business or profession. He can act with the party he prefers, unite with the church of his choice, or refuse to co-operate with any party or church. In such cases man is free, that is, he has liberty of action.

Liberty, or external freedom, applies, therefore, not to all external actions, but to those which violate no law. In regard to these, man has liberty to execute his volitions. Hence, in respect to external action in general, man has but a partial, or limited freedom; but this is not the freedom of the will, but freedom to execute those volitions of the will which violate no law, either human or divine.

Liberty of action in the cases in which it is found, is not only freedom from external restraint, as a stone thrown into the air is free to fall, but it is also freedom from external constraint. A man is not free in doing what he is compelled to do. Freedom includes exemption from external compulsion. It is, therefore, freedom from *co-action*, that is, both from external restraint and from external constraint.

Though liberty of action implies freedom from both external restraint and constraint, yet such action is not free from the control of the man himself. The person, by the power of his will, puts forth the volition, and the volition, in the absence of external hinderance, necessitates the action. By liberty of action, we are, therefore, to understand the liberty of the person to act. The action, as such, abstractly considered, is not free from constraint, for it is caused by the volition; but it is free from restraint. It has the same kind of freedom that a stone has when thrown into the air. The stone

is free to fall, that is, it is not hindered from falling; but it is not free from falling; for it is constrained to fall by the force of gravity. In like manner, though an action may be free from restraint, it is not free from internal constraint, since it is determined by the volition; yet free action, so far as man is concerned, is freedom both from external restraint and from external constraint.

**2. Volitions are free from restraint, but not from constraint.**—To suppose them not free from restraint is to suppose that volitions actually put forth have been prevented from being put forth, which is absurd, since whatever is, has not been prevented from being. But volitions are not free from constraint. As events, they come under the law of causality, which may be stated, *All events have causes.* That volitions have causes, that is, that they are caused or necessitated, can be proved syllogistically, thus:

All events have causes.
Human volitions are events.
∴ Human volitions have causes.

Every volition is, therefore, caused or necessitated; but, as we shall presently see, the volition is caused, not by the motive, but by the will itself.

When it is said that volition is not free from constraint, it is not to be understood that the volition previously existed, and that it is forced, in opposition to its resistance, to be what it otherwise would not be, for the volition has no previous existence to be acted upon; but it is to be understood, in saying that the will constrains the volition, that the will brings the volition into being, that is, causes it to be, and to be as it is.

In like manner, when it is claimed, though incor-

rectly, that motives constrain or compel volition, it is not to be understood that the motives constrain or compel a volition already existing to change, or to be what it otherwise would not be, but that motives, acting upon the will, not as a volition, but as a faculty, compel it to assume a certain state, condition, or attitude, called volition, thus bringing the volition into being, and causing it to be what it is. If this be so, the will is not an active power, but a passive susceptibility, and choice is a passive determination of the will, and not its free action.

**3. Is the will free?**—The will is the cause of volitions; but, because volitions are caused, it does not follow that the will, which is the cause of volitions, is caused to cause them. The question is not, Are volitions free? but, Is the will free? In what sense is the will not free? In what sense is the will free?

The will is not free in the sense that it is, in general, exempt from the influence of motives. But what is the nature of this influence? Are motives causes compelling the will to choose as it does, or are they reasons for the choice? The question is not, Is the will free from the solicitation of motives, but, Is it free from compulsion and from prevention? But prevention from a certain decision is compulsion not to make the decision, that is, compulsion to the contradictory decision or to some contrary decision.

Motives are indeed causes; but causes of what? What are their effects? They are causes in the sense that they awaken thought, affect the sensibility, and influence the will. But what is the nature of this influence? Do motives compel, or do they solicit the will? Do the motives cause the volitions, or does the will cause the volitions in view of motives? If the motives cause the volitions, then the will is passive in volition, and the

volitions are phenomena caused in a passive susceptibility, called the will, by the action of forces called motives, thus bringing the phenomena of the will within the province of Mechanics. But is the will a passive susceptibility, and not an active power? Can the phenomena of volition be brought within the province of Mechanics?

That the phenomena of volition are not included within the province of Mechanics is demonstrably certain; for, if so, the volition would, in a given case, be the resultant of the action, at the time, of all the forces called motives. Thus, a person standing at one corner of a square, and solicited by two friends, one at each of the adjacent corners, the motives for going to the two being equal, would go in the diagonal of the square, passing the other diagonal by his momentum, till drawn back by the motives, and after a few vibrations, would finally come to a stand at the middle point of that diagonal. But this would not be the case. If it be said that the motives are never equal, the reply is, that so long as either is not zero, the volition, if caused by the motives, would be the resultant of the action of the motives. But the fact is, that in choosing one alternative, the motive soliciting the choice of the other, though not without influence in inducing deliberation, is without volitional effect. Hence, motives are not causes of which volitions are effects. The will, therefore, though not in general, free from the solicitation of motives, is free from necessitated determination by motives.

The will is not passive in volition; for, if so, it would not itself make the decision, but being quiescent, save as it is passively affected, the volitions would be the necessitated movements of the will, analogous to those of a foot-ball as it is kicked about by contending parties. The same results would follow, so long as the

will is regarded as passive, whether the motives are impulses, attractive forces, allurements, or enticements, acting through the appetites, affections, desires, or aversions. The motives would be causes determining the volitions as effects. This would make a volition the resultant of motives, which as we have shown above, is not the case.

The will is free to suspend choice, that there may be opportunity for further reflection.

The will is *active* in volition; it makes the decision. We are conscious of the exertion of the power of the will in making the choice. The motive does not choose; but the will chooses. The will is not a passive instrument swayed by motives, as the weights sway the balance; but it is the power which a reasonable soul has to decide in view of motives as reasons. The will as free may refrain from putting forth volitions which it has full power to put forth; hence, the absence of a volition does not imply the absence of the power to bring it into being.

As motives do not constrain or necessitate the decision of the will, so neither do they restrain or prevent the decision; for then they would necessitate the contradictory or some contrary decision. The will is equally free from constraint and from restraint. The freedom from restraint is freedom to choose a given alternative. The freedom from constraint is freedom to choose any other possible alternative. But why does the will choose one alternative rather than another? The choice of any alternative is accounted for by the fact that the will has alternative power. An effect is explained by a cause capable of producing it.

In the order of time, the choice follows the consideration of the motives, and the execution follows the choice.

**4. Does the will ever act without motive?**—In case of contradictory alternatives, the decision must, in some way, be made in favor of one or the other, since, in this case, but two alternatives are possible. Let the motives to choose these alternatives be equal, and let the will itself make the decision. Then the will decides, virtually, in the absence of motives; for, since, by hypothesis, the alternatives are contradictories, to choose either is not to choose the other, and the motive to choose either is an equal motive not to choose the other, and since the positive motives for choosing the alternatives are equal, and these are equal motives for not choosing the other, the motives for choosing either reduce to zero, or there is no choice; but, since a decision is made, it is made virtually without motives.

To make this still clearer, let the contradictory alternatives, the fact of deciding in favor of one or the other, and the equal motives remain, and let the motives diminish equally till each becomes zero, then there is decision absolutely without motive, proving that, in this case, the will is free.

Let the motives still diminish equally. They will become negative, but will continue equal. Each motive becomes a motive for choosing the other alternative, and cancels the motive for not choosing that alternative, and again, we would have decision virtually without motive.

In these cases, there is volition, if not choice, without motive.

**5. Condensed statement of phenomena.**—The complex phenomena connected with the will are, therefore, the following: Alternatives, any one of which is a possible object of choice or volition; in general, motives soliciting the will to choose one or more of the alternatives; deliberation or consideration of the motives in favor of the different alternatives; freedom of the will

from compulsion and from prevention; the decision, that is, the volition or choice of one alternative; the execution of the volition, that is, the external action which secures or accomplishes the alternative chosen.

**6. The decisions of the will not necessarily unreasonable.**— Though the will is free, the soul is rational; hence, the decisions of the will are not necessarily arbitrary or irrational. These decisions ought to be, and may be, in the highest degree, both intellectually reasonable and morally right. When truth and right are involved, the will is under moral obligation to decide in accordance with the light of reason and of conscience. Though the decisions of the will are not necessarily irrational, yet they may be so, and often are so, as a matter of fact. The will has the fearful power to decide to act contrary to the dictates of truth and righteousness, and this power it often exerts; but, for the exertion of this power, it is responsible.

**7. Meaning of the words obligation and responsibility.**— The words, *obligation* and *responsibility* or *responsible*, are of frequent occurrence in discussions pertaining to the moral aspects of the will, and hence their meaning should be clearly understood and discriminated.

When it is said a person is under *obligation* to do or not to do a certain thing, the meaning is, he *ought* or *ought not* to do that thing.

When it is said a person is *responsible* for his actions, the meaning is, that he is justly accountable, or deserves reward or punishment, according as the actions are good or bad, and that he must meet the consequences.

## CHAPTER III.

### MORAL RESPONSIBILITY.

**1. Freedom is an essential condition of responsibility.** — If the will is necessitated by motives to choose a given alternative, that is, if the choice is unavoidable, the person choosing is not morally responsible. He neither merits praise for a right choice, nor deserves blame for a wrong choice. Indeed, the choice can, on this supposition, be properly called right or wrong, only by a comparison of the choice with an external standard, and not in the sense that the man is commendable or censurable for his choice, since he chooses as he does, because he can not do otherwise. How could it be morally wrong for an individual to choose what he can not help choosing? How could he be guilty for such a choice? Since the choice determines the action, how could he be responsible for the action? If a man suffers his will to be enslaved by passion, he is responsible for this enslavement and its consequences; but this enslavement is, in general, not absolute.

If the will is not free, it would always be unjust to the individual to punish him for crime. It could be justified only on the ground that such punishment is a motive deterring others from similar crimes. But even this motive does not always deter from crime. Notwithstanding the punishment, crime is still committed. The offender, must, therefore, be impelled by a stronger motive, and can not avoid the crime; hence, to him, punishment would be an act of injustice.

**2. There is no exception to the principle that freedom is an essential condition of responsibility.**—If a debtor should willfully squander his resources, and thus deprive himself of the power to discharge his obligations, he is not, therefore, released from moral responsibility. He had the power to meet his obligations, and for the proper use of this power he is responsible. In willfully squandering his resources, he has incurred guilt; and for this guilt, he may justly be branded as dishonest by honorable men.

If it be asked, Is he now under obligation to pay his debts, and can he justly be branded for not doing it? the answer is: Though the legal obligation is still in force, unless he has availed himself of the provisions of a bankrupt law, he is not under moral obligation to do what he can not do, and he ought not to be held responsible for not doing an impossibility; but, when he had power to pay his debts, he was under moral obligation to pay them. He is now held responsible for failing to do what he had the power to do, and what he was under obligation to do. If the ability to pay the debt should return, the moral obligation to pay it would revive. Present obligation implies present power.

A man may indeed now be guilty for a past crime which he can not now avoid, since it is done and can not be recalled, though he may repent of it; but the guilt was incurred when the crime was commited, when he had power to avoid it.

He is not now guilty for not undoing what he can not now undo; but he is guilty for having done what, at the time, he had power to avoid.

**3. Freedom of the will is freedom to choose any one of the possible alternatives.**—The question is sometimes asked, Can the will choose differently from what it does choose? It is possible to become mystified by

such a question. It is, of course, impossible for the will to choose a given alternative, and, at the same time, not to choose it, but to choose a different alternative. The true question is, Can the will choose a different alternative from any designated one of the possible alternatives? The answer is, It can. Let *A* name any one of several possible alternatives, then *B* can always choose another.

It is sometimes said that we are conscious of the power to choose differently from the choice actually made, but this is not correct, since we are not conscious of powers, but of phenomena. We know powers by the rational intuition of their conditional necessity as the logical antecedents, or necessary conditions, of phenomena; but in case of the power of contrary choice there is no phenomenon implying such a power, since there is no choice contrary to actual choice.

If there is in the human mind a consciousness of the power to choose contrary to the actual choice, this fact of consciousness would settle the question, and controversy would be at an end. The fact that the existence of such power of choice is called in question by a large class of thinkers, is proof that there is no consciousness of such a power, for a datum of consciousness always compels recognition.

There is, however, in every unsophisticated mind a belief or conviction that there is power of contrary choice, and of this belief or conviction such a mind is conscious. Before choice, there is a conviction that there is power to choose any one of the possible alternatives; and, after choice, that any other one of the possible alternatives might have been chosen instead of the one actually chosen; but a conviction that there is a certain power is not a consciousness of that power.

That the will can choose any one of the possible al-

ternatives, follows from the fact that the volition is not a resultant of motives, but is an act of the will.

Since the volition is an act of the will and not a resultant, it is free both from the constraint and the restraint of motives. Freedom from constraint is freedom from the necessity of choosing any given alternative; and freedom from restraint is freedom to choose any possible alternative. Freedom, both from constraint and from restraint, that is, the freedom of the will both from compulsion and from prevention, is the indispensable condition of responsibility.

**4. The voice of conscience is decisive as evidence in favor of liberty.** — But what does the conscience of the criminal say? It declares him guilty and deserving of punishment. The criminal arraigned before the bar of his own conscience, confesses his crime, admits his guilt, and acknowledges the justness of his punishment.

If he believed that his choice was necessitated, his conscience would acquit him of guilt, not that he did not do the deed, or that he did not will to do it, but that he could not help doing it, since he could not help willing to do it. But his conscience does not acquit him of blame. In his inmost soul, he believes that he is guilty. He could not be guilty, in the sense of being to blame, unless his will was free in the act of volition. He could not believe himself to be guilty, unless he believed himself to be free; but he does believe himself to be guilty; therefore he believes himself to be free. The voice of conscience is not the voice of a sophist, but it is the voice of nature, yea, the voice of God declaring in tones not to be misunderstood, that the transgressor is not passive, but active in his crimes.

Conscience, in approving the right and condemning the wrong, postulates the freedom of the will. If, therefore, the will is not free, the action of conscience, the

noblest of our moral powers, is based on a false postulate, and the very constitution of our nature is self-contradictory.

It would, of course, be reasoning in a circle, to assume responsibility, and deduce freedom from this assumption, and then from freedom deduce responsibility, or the reverse. The fact is, either responsibility or freedom can be established on evidence independent of the other; and, when established, the other may be inferred as a logical antecedent or a logical consequent.

The phenomenon of conscience is a proof of responsibility; but responsibility implies freedom, as its necessary condition, or logical antecedent.

The fact that a volition is not a resultant of motives is a proof of the freedom of the will; but this freedom involves responsibility as its logical consequent.

**5. Ground of responsibility.**—The ground of responsibility is moral obligation to do right and to avoid wrong. Freedom of the will is the condition of moral obligation, and hence of responsibility. Man is responsible for the use he makes of his freedom of will and liberty of action.

Though the freedom of the will is the condition of obligation, it is evidently not the ground. The fact that a man is free to do a certain thing, is no reason why he should do it. Not only is there liberty to perform one action and to avoid another, but there is reason why the one should be performed and the other avoided. But why should a person do one thing and avoid another? What is the ground of obligation?

Every man knows that happiness is an object of desire, and that misery is an object of aversion; that in all lawful ways, he has the right to seek to gain the one and to avoid the other; and that, so long as he does not forfeit his liberty by crime, or encroach on

the rights of others, he has the right to enjoy, without hinderance, the fruit of his labor. The rights which one claims for himself, he is under obligation to concede to others, since they have the same right to claim for themselves what he demands for himself.

Not transient pleasure, frivolous or unsatisfying, but happiness, substantial and abiding, is the birthright of man, and this he may enjoy by obedience to the laws of his being, which are the laws of God, unless, like Esau, he sells his birthright for a mess of pottage.

To attain to happiness, man must have the opportunities of education in the development of his powers, physical, intellectual, and moral. He must have the right of property, or the enjoyment of the fruit of his own labor. He must be protected in person and property. To secure these blessings, they must be mutual and universal, limited only by the requirements pertaining to the general good.

Since others have no right to encroach upon our rights, we have no right to encroach upon theirs. Since our happiness is promoted, not only by our own efforts, but by the good-will, and, in certain cases, by the aid of others, and since this good-will and aid we gladly accept, they, in like manner, are entitled to our good-will and aid, so far as that aid can be reasonably afforded. Mutual benevolence is, therefore, the fundamental moral obligation between man and man, and is of universal application. Therefore, "*All things whatsoever ye would that men should do to you, do ye even so to them.*" This is the law of righteousness.

Man has no right to squander the powers which God has given him, but he is under obligation to develop these, in order to promote his own happiness and that of others. To promote his own happiness, it is necessary that he guard his life, liberty, and reputation, pre-

serve his health, protect his property, and promote his physical, intellectual, and moral perfection. The preparation which enables him to advance his own interests, best qualifies him to promote the welfare of others.

The family relations of husband and wife, parents and children, brothers and sisters, involve peculiar and sacred obligations.

Special duties are implied in the relations of teacher and pupil, pastor and people, employer and employee.

Man is also under certain obligations to society, to his government, and to the world at large.

Our obligations to *God* are based upon the relations which we sustain to Him as our Creator and Benefactor. In this case, the inequality of the parties modifies the statement of the law of benevolence. It would not do to say, Whatsoever we would that God should do for us, we should do for him; for we desire His help and protection, and many other favors which we are unable to render Him. But certain things are due to God from man. We should show repentance towards God for past sins by confessing and forsaking them. We should have faith in His mercy and constant goodness. We should exhibit reverence for God in view of His power, wisdom, and holiness. Above all, we should render obedience to His righteous laws.

The science of Ethics may, however, be well understood by those who refuse to reduce its principles to practice. Virtue is not identical with knowledge, as Socrates taught, since man does not always do what seems to him to be morally right. The will does not always choose the greatest apparent good. A man may know that virtue is the highest good, and that it will bring the greatest reward; and yet, with this knowledge before his mind, and with his eyes open to the consequences of evil, he may follow the lead of his appetites and passions,

and pursue the path of sin and death. Justly may he apply to himself the language of the poet,

"Video meliora proboque, deteriora sequor."

His will, in yielding to the solicitations of appetite and desire, refuses to obey the voice of reason and conscience. His moral nature is disordered, and he is brought into captivity to the law of sin and death; yet he is free to seek what he so much needs — the regenerating energy of the Spirit of the living God.